PUBLISHED FROM 'THE BUILDER' HOUSE, Catherine-street, Aldwych, London, WC2. *Telephones:* Temple Bar 6251-2-3-4. *Annual subscription:* £4; for six months £2. Single copies (including back numbers up to 12 months old) 1s. 6d. (post paid 1s. 10d.). Back issues more than 12 months old 2s. 6d. (post paid 2s. 10d.). *Indices* are produced in July and January each year; copies are sent free on application.

NEWS SUMMARY

THE PRELIMINARY SCHEME for the new Guy's Hospital is shown p. 529

TORONTO'S new City Hall and Square is the subject of an international architectural competition. p. 544

'THE INTELLIGENCE TEST for a town planner is not to arrange all his buildings in an orderly row in the shortest possible time, but to make an interesting, useful and individual composition of them' Sir Wm. Holford told the Housing Centre. p. 545

THE PLAN for redevelopment of the Barbican area prepared by Chamberlin, Powell and Bon has been accepted by the City. p. 546

THE FIRST SECTION of the London-Yorks Motorway will go out to tender within the next few weeks. p. 547

THE LONDON COUNTY COUNCIL's officers will discuss with MoHLG officials suitable sites for the LCC's New Town. p. 549

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THE BUILDER

Incorporating ARCHITECTURE & THE BRITISH ARCHITECT

Vol. CXCIII September 27 1957 No. 5974

REDEVELOPMENT OF THE BARBICAN

IN our last issue we summarised the proposals contained in the recent Report of the Special Committee to the Court of Common Council with reference to a section of the City which has been the subject of considerable controversy. This Report, which was adopted by the Court at its meeting on September 19, is mainly concerned with the issue raised by Mr. Duncan Sandys, then Minister of Housing and Local Government, in the covering letter he wrote to the Lord Mayor accompanying his decision not to approve the Scheme put forward by the 'New Barbican Committee.' While expressing admiration for the imaginative character of that scheme, the Minister wrote that his main difficulty in accepting it was 'that it contemplates the construction of vast factory, office and other commercial premises, which would greatly add to the already excessive volume of employment in that area' and, on balance, 'would appreciably increase the congestion in Central London.' He added: 'I am convinced that there would be advantages in creating in the City a genuine residential neighbourhood, incorporating schools, shops, open spaces and other amenities, even if this means foregoing a more remunerative return on the land.'

The Special Committee of the Court of Common Council accepted the views expressed by Mr. Sandys and instructed Messrs. Chamberlin, Powell and Bon to prepare a plan for the erection of a 'genuine residential neighbourhood' on the 25.05 acres south of the Barbican, 'virtually cleared by war devastation.'

This plan, which, incidentally, involves decking over the underground railway, allocates 24.1 acres to residential development to accommodate 5,876 residents. Also 615 residents could be provided for on 4.08 acres, north of the Barbican, i.e., about 6,500 in all; 2,243 flats would accommodate the 5,876 persons (i.e., 2.6 per flat), and it is noted that they are not intended primarily for the family unit, since 'the household unit is likely to be smaller than the average and the room occupancy lower than for normal local authority housing schemes.' The Committee propose that before embarking upon the scheme a detailed prospectus should be drawn up showing the types of accommodation proposed and the rents; such prospectus to be placed before the big employers.

The City is the Capital of the Commonwealth and the headquarters of commerce on a world-wide scale, and the point at issue is how not only to relieve it from the congestion which hampers its efficiency but also to prevent its increase through too dense development. Headquarters require ample space, a worthy setting and ready accessibility. Given these conditions their numbers and importance may well increase and provision should be made for this contingency. Also the City's monuments such as St. Paul's must be given the setting they deserve. The question is, can these objects be achieved within the space available, and is there room within it for a 'genuine residential neighbourhood'? In any case, it seems essential that headquarters should be relieved from the coming and going of those who merely carry out routine work. They could surely, with advantage to all concerned, be accommodated in branch offices in the suburbs or new or expanded towns, near to their homes. This is the obvious answer for the family man.

There remain, however, a number of the single and some of the higher executives who would find a home or *pied a terre* close to their offices a great convenience. The object of the present plan is to provide a residential neighbourhood for these people. Residential accommodation is provided in blocks of flats, three of them 30 storeys or 300 ft. high. The planners' intention is that the neighbourhood should be treated as a precinct but of course, meeting the daily needs of the inhabitants of these high blocks will involve some wheeled transport. The plan must, of course, be considered both functionally and aesthetically in relation to plans for the reconstruction of the City, including Sir William Holford's plan for the precincts of St. Paul's, and for the County of London, the boundary

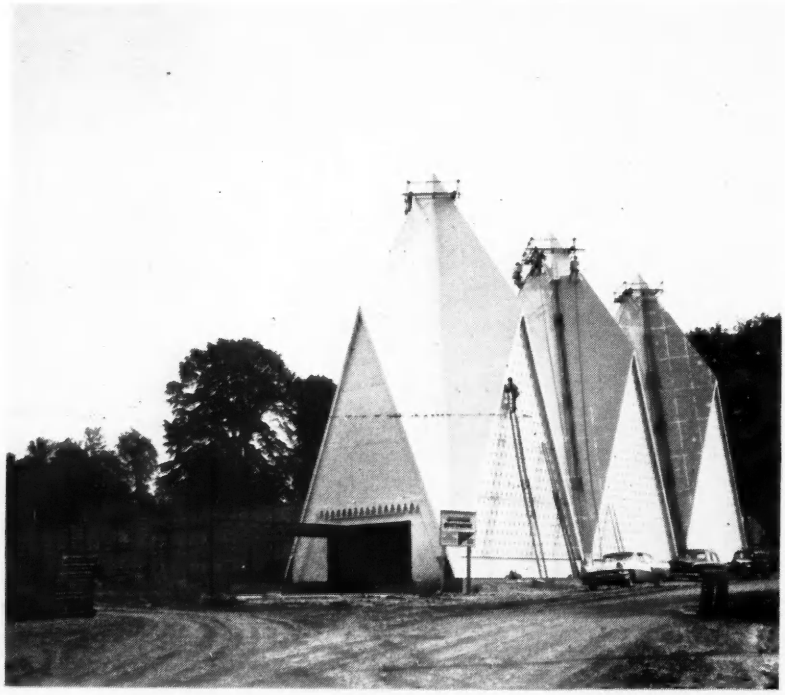
of which nearly adjoins the site. It is inevitable that the skyline of old London should disappear, but some of us cannot help regretting that the new one and the elevational expression of its buildings, the subject of our last week's Leader, seem likely to be so cosmopolitan in character.

THE BANK RATE AND BUILDING

ALL sections of industry are bound to suffer in some degree or other from the effects of the increase in the Bank rate from 5 per cent. to 7 per cent., which was announced by the Chancellor of the Exchequer last week. The effects of this drastic measure on the building industry cannot be exactly foreseen, but the credit squeeze has already led to reduced order books among builders, especially in rural areas, and the latest tightening of the screw can only accentuate this tendency.

Building firms are generally in greater need of credit than those in other industries, both on account of the size of the projects that they have to finance and because they do not get paid in full until the final settlement. Among the uncertainties of the present financial situation what does stand out clearly, however, is that it will now be more important than ever for clients to pay their builders promptly, especially the local authorities, who are the worst offenders in delaying payment. Long waits for money are bound to lead to builders submitting higher tenders, thus defeating the aims of the credit squeeze in trying to stabilise prices. Firm price tendering, if it leads to variations kept to a minimum, could well prove a blessing in disguise in promoting early settlement of accounts.

If the new Bank rate continues for any length of time it is certain to make house purchase dearer, whether the purchasers borrow the money to finance the operation from local authorities or building societies. Following the Chancellor's announcement, the Building Societies Association was quick to issue a statement to the effect that the increase in the Bank rate was not likely to have 'immediate general effect' upon the rates paid or charged by building societies. Whether it would ultimately do so would depend on whether the increase led to a general increase in interest rates. The statement added that the subject would be reviewed by the Council of the Association at its meeting in October.



PROGRESS AT BRUSSELS.—The Crystalline Hall, part of the UK pavilion being erected for the Brussels Exhibition next year, is nearing completion. Architects: Howard V. Lobb and John Ratcliff. This part forms the entrance to the main exhibition area; the spires are 70 ft. high and are constructed in plywood panels

Notes of the Week

RIBA Inaugural Meeting

THE RIBA opens a new session on Tuesday, November 5, at 66, Portland-place, when Mr. Kenneth Cross delivers his presidential address, and later will present the London Architecture Medal to Messrs. Chamberlin, Powell and Bon for their Bousfield School in South Bolton Gardens, SW10. Diplomas for the RIBA Distinction in Town Planning will be awarded on the same evening to Messrs. D. E. E. Gibson, H. J. Whitfield Lewis and Arthur Ling.

Special interest attaches to this Presidential Address. The details of the tour which the President and Secretary made earlier this year to Malaya, Australasia and the New World are by now well known and hardly require more than a passing allusion; what the architectural world waits for is news of the steps proposed by the special committee of the Board of Architectural Education to implement the President's far-sighted idea of the basic examination in architecture, common to all Commonwealth countries, which when passed would require only a further test in local architectural practice to enable the holder to work as an architect in a Commonwealth country other than that of his training.

No one supposes that such a framework, simple as it is in theory, will be equally simple to work out in practice, but the RIBA has met problems more difficult than this in the past and successfully surmounted them. This present problem is one which must be solved if the RIBA is to maintain its place as the leader in Commonwealth architectural influence.

En Garde at Ampthill

PROFESSOR RICHARDSON, whose foe is folly, has found in the local urban district council at Ampthill, his Bedfordshire home, an opponent which, if not worthy of his weapon, wit, has at least incurred his displeasure. Ampthill has rejoiced for many years past in public lamp lanterns supported on brackets which have lit its charming streets. The Council, no doubt at the instance of highway authorities, recently decided to install concrete lamp standards and despite protests from many residents and against the advice of the Royal Fine Art Commission, has now made a start with the work.

Sir Albert, finding sweet reasonableness useless, has now had recourse to ridicule, and the urban councillors awoke last week to find themselves snug in the pillory of *The Times* back page, where photographs of the old and the hideous new are flanked by a picture of a well-lettered notice (*pace* Sir Francis Meynell's 'non-V' intervention) which the Professor is displaying outside his house. This reads: 'These incongruous lamp posts which detract from the beauty of this historic town were erected by the Urban District Council against the advice of the Royal Fine Art Commission.' The technique of protest of course is not new (a variation is the action of the purchaser of a new 'spec' house who

(*Notes continued on page* 530.)

Rebuilding of Guy's Hospital, London

Perspective view of south elevation

WHAT SHOULD BE the tallest and certainly the most up-to-date hospital in Great Britain will shortly commence building. The new Guy's Hospital will occupy a seven-acre site east of the building in Bermondsey founded by Thomas Guy early in the 18th century—a site made possible by Hitler's bombs and the foresight and industry of the hospital's clerk, treasurer and governors. A new master plan for the site has been prepared by Mr. Arthur S. Gray, FRIBA (of Watkins, Gray and Partners), and a start will be made on a multi-storey surgical block at once This block (a perspective view of which is shown) will provide 378 surgical beds in 14 wards and will include a teaching section, a casualty department and a complete floor of operating theatres. The services needed will require special attention, and Mr. P. G. Burt, of Chicago, has been engaged as associate consulting architect. The over-all cost of the new block is estimated at more than £2¼ m. It is hoped to complete by the end of 1960.

The fate of the original building, Guy's House, now 230 years old, must be regarded as uncertain, but all will hope that any plan for future development will retain this beautiful building and allow for its repair.

ARTHUR S. GRAY, FRIBA
(Watkins, Gray and Partners)
Architect

P. G. BURT, Consultant Architect

Y. J. LOVELL & Son, Ltd., Builders

Site of new building with present hospital at rear

(*Notes continued from page* 528.)

got necessary repairs done by the simple expedient of displaying outside a notice reading 'SHOW HOUSE') but that will hardly help the council. We hope they may see reason.

☆ ☆ ☆

NONETHELESS, the fact remains that those authorities who look for a lighting standard for contemporary needs may look far and find little. There was some years ago a competition for the best-looking public lamp standard, from which the most successful visually that emerged was one in laminated timber. Probably timber lamp standards are not a feasible proposition, and if there is a moral to be drawn from *l'affaire Ampthill* it is that some body such as the Council for the Preservation of Rural England should turn its attention once more to seeking a practicable solution. No doubt Ampthill, and many another local authority besides, would be thankful.

Work Study and Building

FOUR FILMS ON WORK STUDY were shown to a large and interested audience of LMBA members on Monday evening at the FBI headquarters in Tothill-street. Made by various industries in collaboration with the British Productivity Council, they set out to show how this scientific application of commonsense can improve productivity in industry. Sir Thomas Hutton, introduced by Mr. N. S. Farrow (chairman of the LMBA Productivity Committee), outlined the two main aspects of work-study as method-study, by which the best method of carrying out a process is established; and time-study by which the standard time taken to do a process is discovered.

Mr. Farrow stated that no film on the merits of work-study had so far been made for building. This is to be regretted, for there is no doubt that the industry could greatly benefit by the lessons of a process which Mr. A. J. Speakman (who commented on the films) described as a new way of looking at old problems. It will be a loss to building if work-study be written off as a *mistique* which covers nothing but the commonsense which every builder likes to think he possesses. That side of it which deals with time-study may, indeed, be invaluable in convincing labour as well as management that a process that is wasteful of time may, if not corrected, lead to redundancy through the outstripping of the firm by more progressive rivals.

New Powers for Parish Councils

THERE is such a flood of new legislation nowadays, that a minor but nevertheless valuable Act can receive the Royal Assent with scarcely anyone except those immediately concerned being aware of it. Such an Act is the Parish Councils Act, 1957 (introduced into Parliament as a Private Member's Bill), which has just come into force, and its provisions are the subject of a new Ministry of Housing and Local Government circular (No. 49/57).

Among the modifications in the authority of parish councils for which the new Act provides is the power to provide seats and shelters in roads; the power to provide public clocks; while among the Supplementary Powers one that looks helpful is that allowing the parish to contribute 'towards the reasonable expenses of any person in providing anything which the parish council or parish meeting is empowered to provide.' Finally, parish councils and parish meetings may combine and use these powers jointly.

Stained Glass

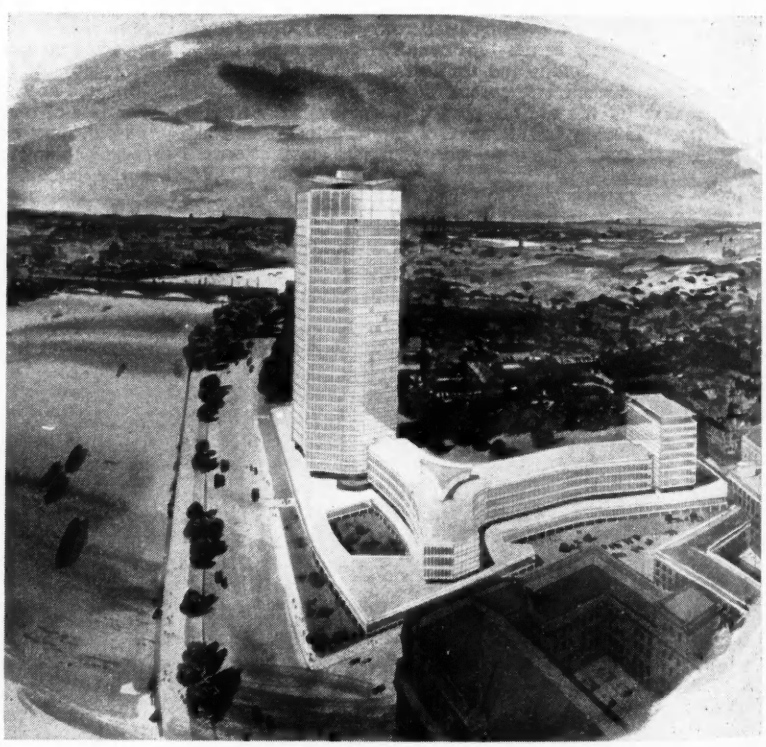
IN these days when a firm states that they believe they are making progress towards a solution, as opposed to having found the complete answer, then that is refreshing news. Such a firm is Aygee, Ltd., who are holding an exhibition (until October 5, at Watts and Co., Ltd., 11, Dacre-street, SW1) of stained glass consisting of seven small windows together with a few coloured drawings and photographs.

The designer, Mr. Wetton, is concerned with the problem of reconciling the apparently incompatible needs of the Church and its liturgy; needs which are not helped by the aesthetic and constructional problems of the use of stained glass as a material.

The designs exhibited, although display is somewhat handicapped by difficulties of space, do illustrate clearly the studios' intention to avoid both the insipid design of much which is so often, loosely, described as 'traditional' and the pitfalls of the personal 'modern' treatment.

The work of the Aygee, Ltd., studios promises well and it is obvious that the chief designer would be responsive to atmosphere and sympathetic to the wishes of architect or client.

NEW OFFICES AND FLATS, MILLBANK.—Planning permission has now been granted by the London County Council for the development of a site on Millbank between Thames House and the Queen Alexandra Military Hospital, near the Tate Gallery. The freehold of the site of approximately 3½ acres is owned by the Crown and, subject to negotiations now in progress, will be leased to the Legal and General Assurance Society who, in association with Vickers, Ltd., will develop the project. The plan is mainly for offices, but provides a number of flats mostly in a separate building. Of approximately 350,000 sq. ft. net area to be provided, a large proportion will be in the tower block of 30-storeys approaching 350 ft. high. The Royal Fine Art Commission has accepted the idea of a building above normal height and raised no objections to the scheme as now envisaged. Construction form is not yet decided. The principal tenants will be the Vickers Group of Companies. The architects are Ronald Ward and Partners of London, and the contractors will be John Mowlem and Co., Ltd. Engineers are R. Travers Morgan and Partners, and the quantity surveyors Franklin and Andrews.



Casualty entrance from the ambulance garages

MEDICAL CENTRE, Stanlow Refinery, Cheshire, for the Shell Refining & Marketing Co.

Architect: ALISTER MacDONALD, FRIBA

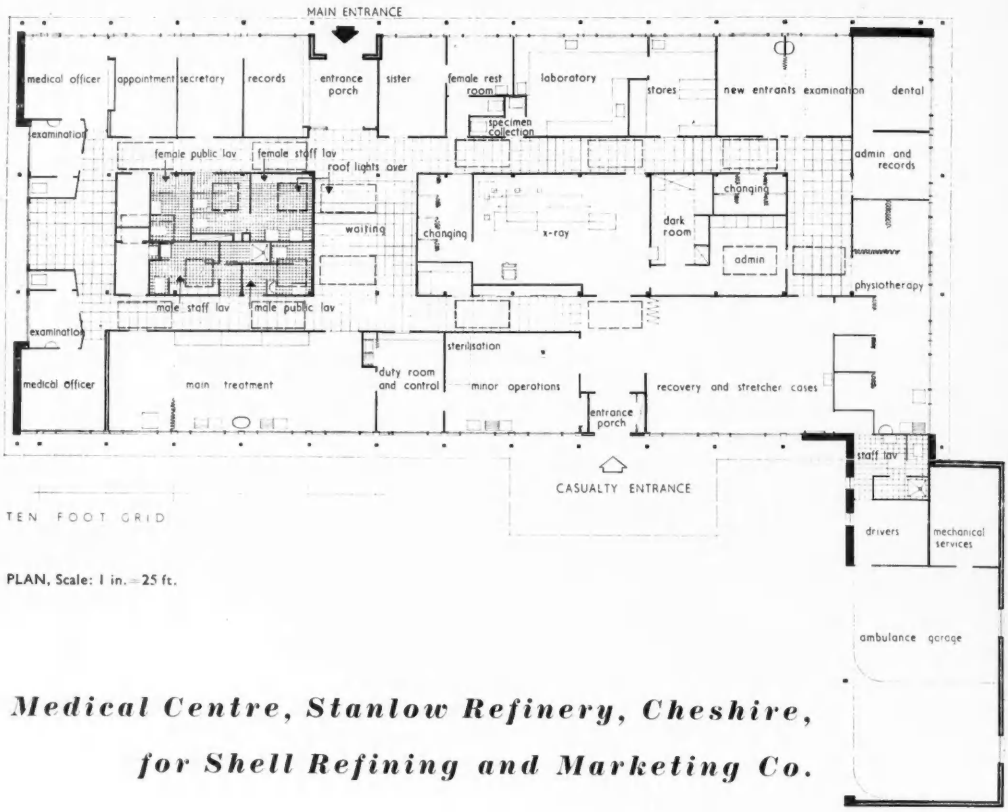
Quantity Surveyors: DAVSON & PRICHARD, FF.RICS

Builders: JOHN LAING & SON, Ltd.

THE CLIENT required a compact building easily supervised and capable of being run by a minimum of staff. The planning problem was complex as the centre had to be capable of a number of different functions: (*a*) examination and documentation of new employees and the filing of medical records; (*b*) routine staff examinations of a preventive nature; (*c*) first-aid facilities which, in the event of a serious industrial accident, had to be capable of immediate emergency expansion; (*d*) facilities for clinics, including dental and physiotherapy work, by visiting specialists.

It was desirable that patients under each of these categories should be kept apart from a circulation point of view, but at the same time some of the central facilities provided (e.g., X-ray, laboratory) had to be planned for use by more than one category of patient.

The opposing circulation needs of separation and compactness were achieved, after a



PLAN, Scale: 1 in. = 25 ft.

Medical Centre, Stanlow Refinery, Cheshire, for Shell Refining and Marketing Co.

Ambulance garages from under the casualty entrance canopy

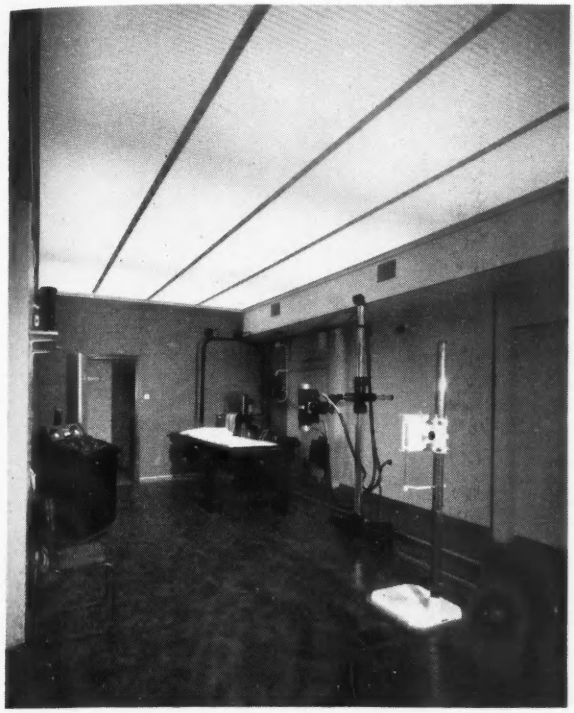
careful analysis of lighting requirements to rooms, by means of a three-bank plan, the central rooms and corridors being top-lit.

The site is within the refinery area and has clay sub-soil of poor bearing pressure. It was necessary to pile, and to make up to the higher road level in order to provide a platform for the building.

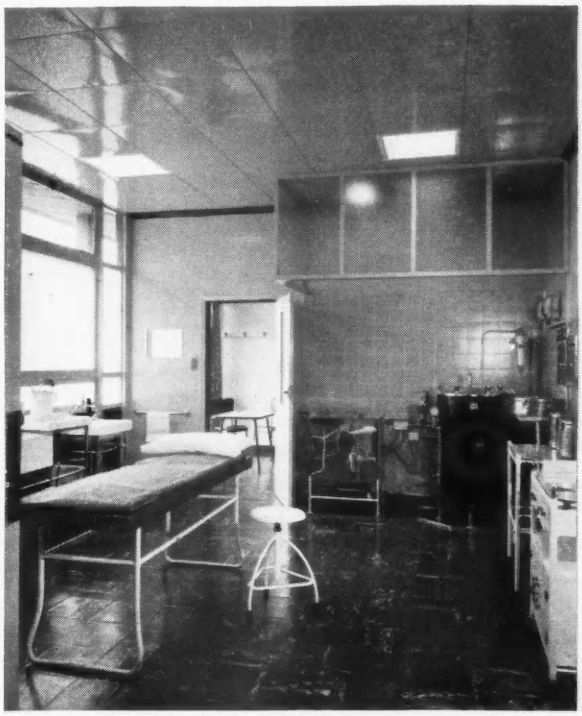
The building is steel-framed, on a 10 ft. grid. There is a suspended ceiling throughout approximately 24 in. below the roof decking, which contains heating and electrical services, roof lights and lay lights, sound and thermal insulating materials.

A high degree of thermal efficiency has been achieved by the use of two layers of insulating material in the roof, one above the suspended ceiling and one above the metal decking, whilst all wall panels are double glazed and backed with a cavity lining.

External facing panels are clear of the structural frame and consist of a light aluminium framework with plyglass facing panels of two types—coloured and clear. Timber horizontally-pivoted windows are incorporated, double-glazed with integral venetian blinds. Internal



X-ray room



Minor operations room

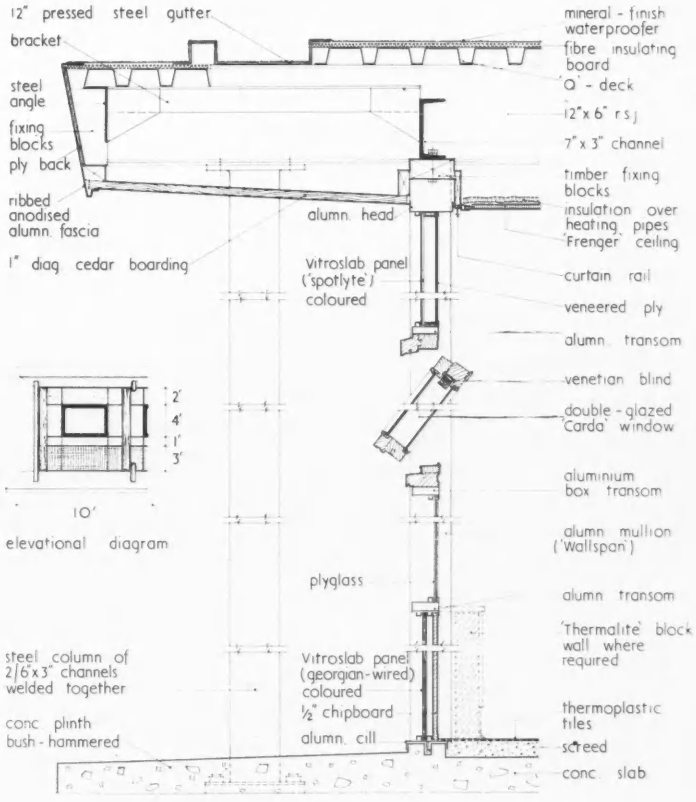
partitions are entirely non-structural and the plan is capable of alteration.

The heating of the building through 'Frenger' trays in the suspended ceiling is by means of low pressure hot water from a calorifier, fed from the refinery steam mains. All pipework throughout the building is concealed but accessible for maintenance purposes. Domestic hot water and electrical installations are normal, the former being in copper and the latter in screwed conduit.

A piped oxygen system is installed in the treatment room, fed from replaceable cylinders. Gas is piped to the laboratory and dispensary from replaceable containers.

Mechanical extract systems (in duplicate) are installed to the central lavatory block, whilst the radiography department is conditioned by means of a plenum system.

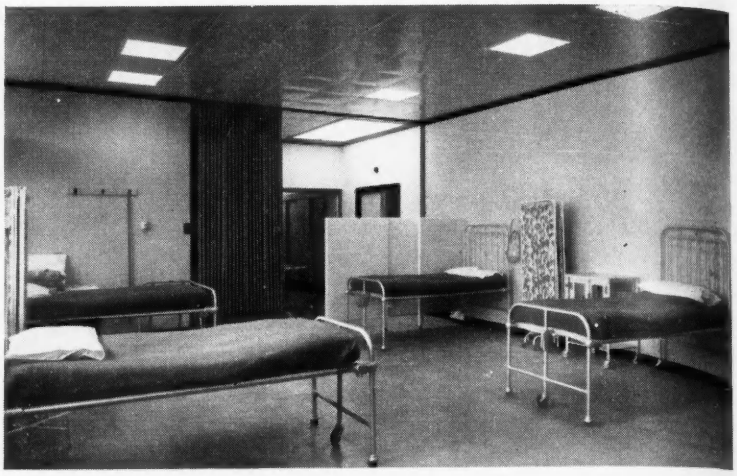
The X-ray room itself is notable for the fact that it is artificially lit by means of an illuminated ceiling of corrugated plastic over the entire area behind which are placed multi-coloured fluorescent tubes. This innovation gives a very high



STRUCTURAL DETAIL, scale: 1 in.=20 in.

standard of illumination evenly diffused for working purposes when screening is not in progress, and avoids unhygienic and cumbersome arrangements of blinds conventionally used to black the out room for screening purposes.

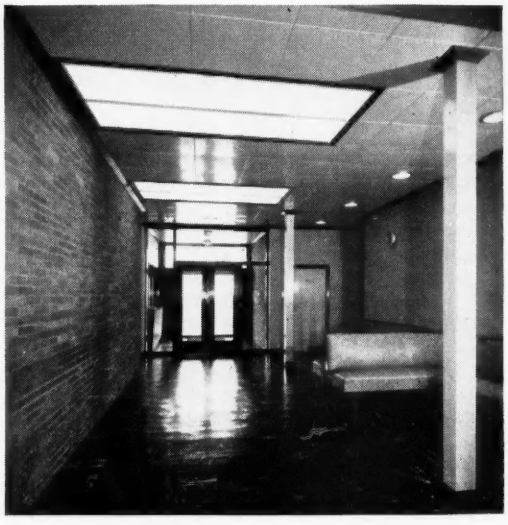
Colour therapy has played a large part in the selection of schemes for the various specialised rooms, bearing in mind their use. The interior provides a cheerful working environment, avoids an institutional effect and makes considerable use of strong colours. Externally the colours have been designed to tone quietly with the surrounding buildings and, in view of the chemical atmosphere of the refinery, to be serviceable.



Four-bed ward unit for recovery and stretcher cases

Medical Centre, Stanlow Refinery, Cheshire

Waiting area

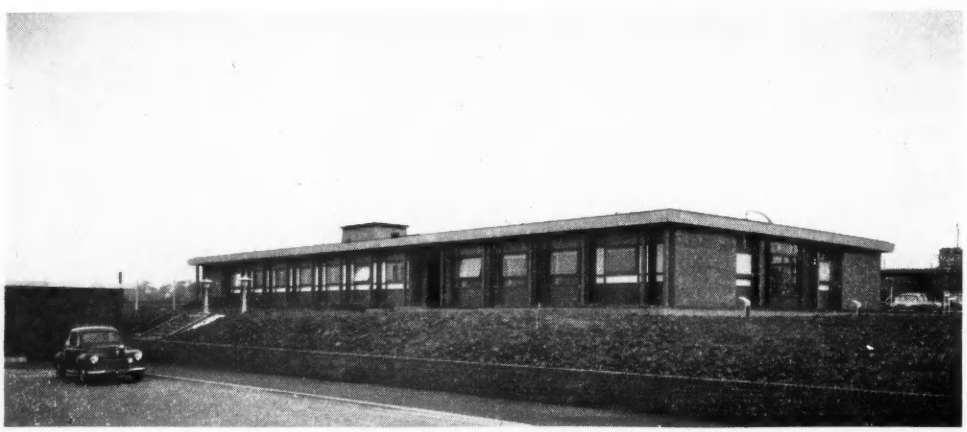


Subcontractors & Suppliers:—

Piling, Franki Pile; structural steel, H. Young and Co.; roofing, aluminium decking and roof lights, Robertson Thain; 'Wallspan,' Williams and Williams; external facing panels, Plyglass; 'Carda' windows, Holcon, Ltd.; insulating blocks, Thermolite, Ltd.; Mechanical services, including air conditioning, hot and cold water, gaslines, heating and extract ventilation, Young, Austen and Young; electrical, T. Clark and Son.

Electrical fittings, Courtney Pope; sanitary fittings, John Bolding; sterilisers, Dent and Hellyer; suspended ceilings, Frenger; plastic light diffusing ceilings, Lumenated Ceilings, Ltd.; joinery, J. R. Welch and Co., Ltd.; sliding door gear, ambulance garages, P. D. Henderson, Ltd.; sliding tracks, Silent Gliss; 'Flexifold' doors, J. Avery and Co.; armour-plate doors, Pilkington Bros., Ltd.

Glazing, Watson and Watson; rubber flooring, Dunlop Rubber Co.; thermoplastic tiles, 'Vinylex' tiles, Semtex, Ltd.; glazed wall tiling, Richards Tiles, Ltd.; ironmongery and name-plates, Denis Waring; radiography equipment, Watson; photographic equipment, Ilford, Ltd.; clocks and signalling devices, Gents; paints, International Paints, Ltd.; office furniture and fitments by Shell supply department, manufactured by Abbess (Liverpool).



Main entrance elevation

OPENING OF THE GOLDEN LANE ESTATE.—Designed by Chamberlin, Powell & Bon, architects, the Golden Lane housing estate was formally opened on Wednesday by the Lord Mayor of London, Sir Cullum Welch, OBE, MC. The picture shows the sixteen-storey 'Great Arthur House' in the background with the community building in the centre; 'Bowater House,' six-storey maisonettes, is on the left and 'Stanley Cohen House,' four-storey flats, on the right. The greater part of the estate has been completed, some 60 per cent. containing 284 dwellings, and work has started on the rest of the development which will contain 20 shops, a public house, 60 underground garages, etc. The total number of dwellings will be 559, and the cost is in the region of £1½m.

CORRESPONDENCE

'Building as a Public Service'

To the Editor of *The Builder*

SIR, — Mr. P. R. Elderfield, in his letter on this subject a fortnight ago, said 'Profits do not require the financier to work to earn them,' and he pictured the financier as a man living a 'sweet and easy life' in Bermuda or Monte Carlo.

There are presumably many financiers of that kind, but are they all such? Is not anyone who has invested savings with the expectation of getting interest a financier and potential profit-maker? I know of thrifty working-class people whose invested savings are producing nice little incomes that help them to enjoy a higher living standard. Is that bad?

What is profit? Surely anyone who has something over after he has met the cost of living is making a profit, and if he invests this instead of spending it, and so helps to check inflation, is he not entitled to some return? In any case, I should have thought that providing finance for industry was a fairly useful activity. Does Mr. Elderfield object to this on principle, or only when it is done in a big way by gentlemen living abroad?

CURIOUS.

Broken Delivery Dates

To the Editor of *The Builder*

SIR,—I was interested to read your comments on September 20 about the decline in the value of new contracts won overseas by British firms. If the experience I have had in recent months of time-keeping by builders and the suppliers of building materials and equipment is general, then my only surprise is that British firms have done so well.

Recently, I moved house. This made necessary some redecoration, the installing of kitchen fitments, electric fire, etc., and the bringing in of gas, electricity and telephone. In my simplicity, I made a schedule of trades and deliveries so that the fixtures might be there to allow the builder to fit and get away before the carpet and linoleum layers came in. In each case delivery dates were arranged and promised by suppliers.

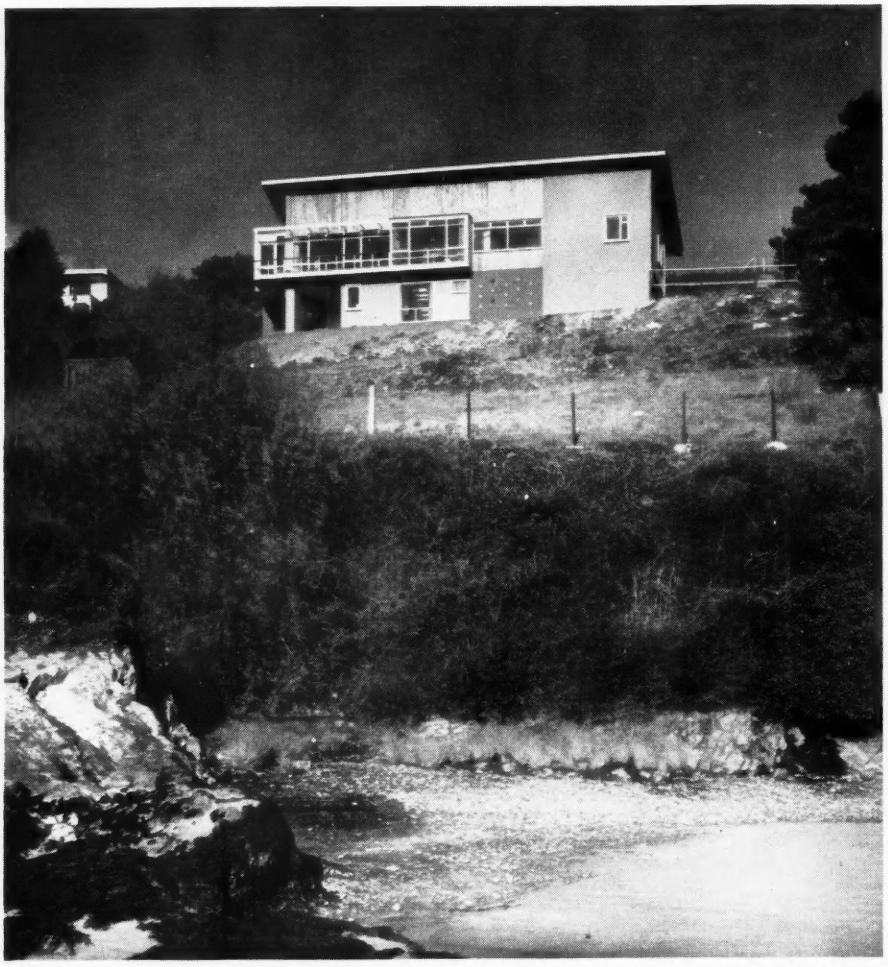
What happened? The builders came in late, the fitments came late (by the time the kitchen cabinets arrived the Gas Board—who with the Post Office telephone service and the Electricity Board fulfilled their promised time-keeping to the day—had been into the house and fixed the gas meter on the wall space reserved for the cabinets, so having to be brought in again to refix), and decoration was going on while expensive carpeting was being laid.

The excuses made by the firms were various (one representative told me in August that, if it was any consolation, one of his clients had been waiting for similar equipment since March), but one thing they did have in common—they did not keep their own promised delivery date, and took no steps whatsoever to advise the builder or me that they could not do so.

The quality of workmanship and of material throughout is excellent, but is this enough? An architect friend to whom I was relating the sad story remarked: 'That is what we find we have to put up with 52 weeks in the year,' which brings me back to the point at which I began this letter: 'Are they the same abroad?'

DAVID GRAHAM.

Finchley-road, NW3.



HOUSE AT PENTIRE, Cornwall

for Mr. & Mrs. Paul Drake

Architect: SHEILA TRIBE, ARIBA

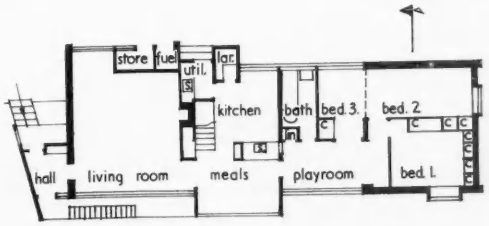
Builders: ROGERS & CHRISTIAN, Ltd.

THE site of this house is a steep and rocky headland which has been very badly developed piecemeal over the last 50 years. The house looks out towards a fine, unspoiled view of the River Gannel with hills beyond. In designing this house the intention has been to be well mannered and inoffensive on the built-up side, where it is closely surrounded by neighbours, but to open up the river side towards the Gannel and the marvellous view.

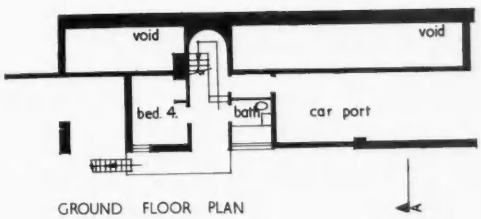
The monopitch roof, finished with cedar shingles, tries to work in sympathy with the steep profile of the rocky site. At the last moment, when work was already in progress on the site, a change in the client's plans made it necessary to omit the staircase from the balcony, the french doors and concrete terrace from the lower hall, and the service yard screen. This latter omission is a serious disadvantage since it leaves the service yard exposed to the access road. It will be added as soon as possible.

Site works were not included in the building contract but will form the subject of a later contract. The plumbing work was carried out by Walter Hocking, Ltd., and the electrical work was by Electrical Services, of Newquay.

SITE PLAN scale 1:5000

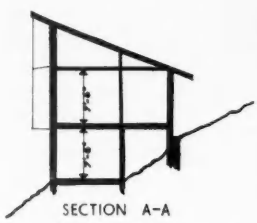


FIRST FLOOR PLAN



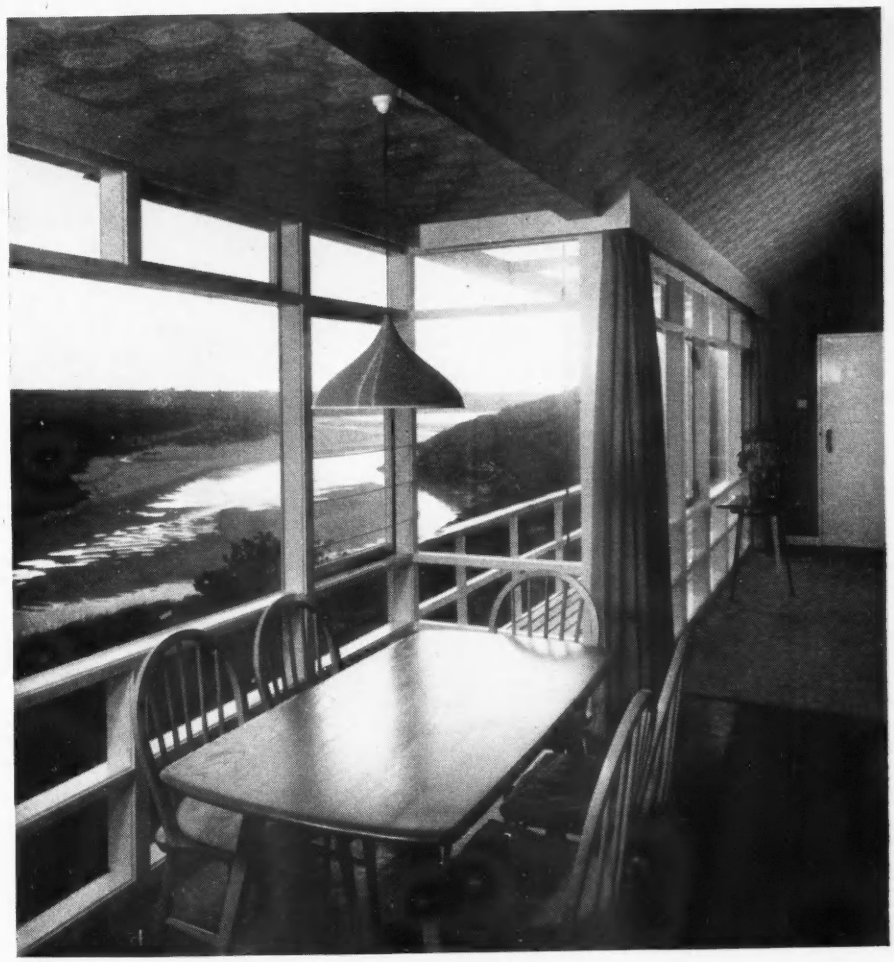
GROUND FLOOR PLAN

Main entrance

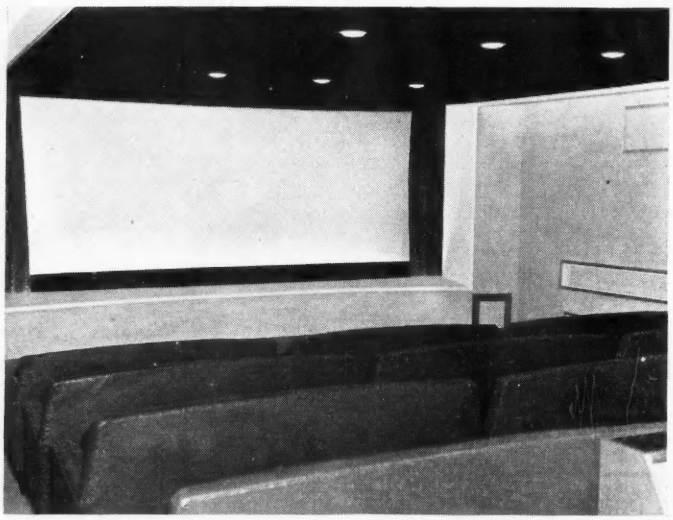


SECTION A-A

PLANS & SECTION
Scale:
1 in.=24 ft.



The dining room overlooking the magnificent view of the Gannel



TWO PRIVATE THEATRE CONVERSIONS

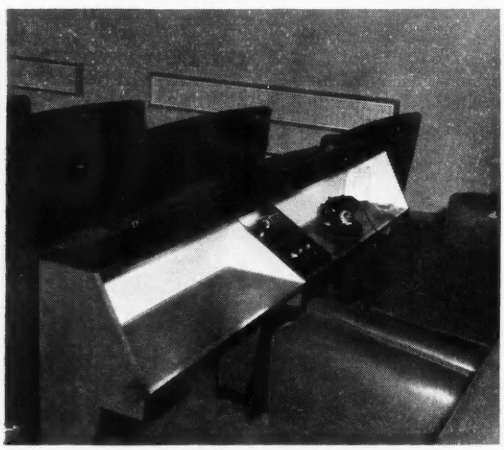
Architects :
JOHN D. MORGAN &
DAVID C. BRANCH, AA.RIBA

Consulting Engineers :
HAROLD WATERMAN & Partners

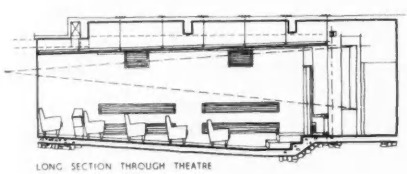
Preview Theatre, Audley Square

Quantity Surveyor:
RALPH SMITH, FIQS

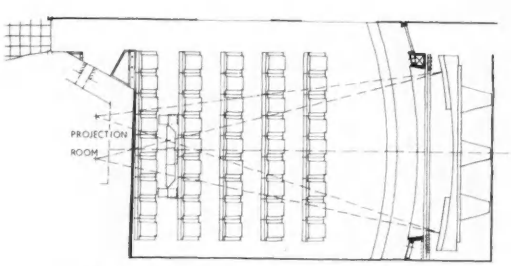
Builders: WARD & Partners



Three views of the preview theatre: top, the wide screen; centre (left) the control unit from which the film can be stopped, or reversed; and right, the projection end of the theatre



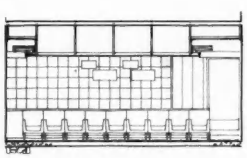
LONG. SECTION THROUGH THEATRE



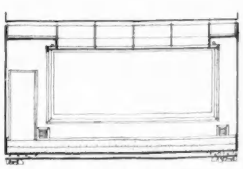
PLAN OF THEATRE

PLAN & SECTIONS, scale: 1 in. = 16 ft.

Projection room



CROSS SECTION TOWARDS REAR



CROSS SECTION TOWARDS SCREEN

for Warwick Film Productions, Ltd.

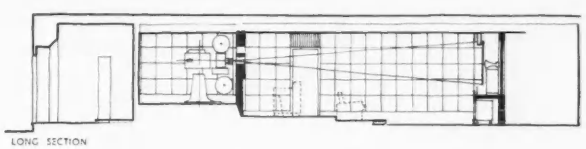
Dubbing Theatre, Soho Square

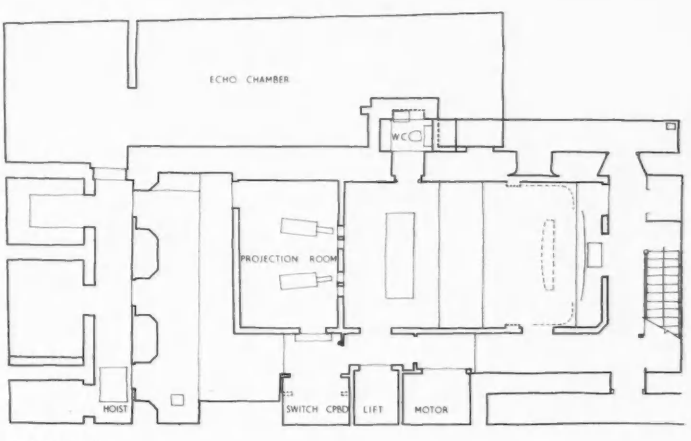
Quantity Surveyors:
LANE & JEWEL, AA.IQS
Builders: HOWARD & Co.

The centre panel beneath the screen is an illuminated frame counter. The hinged acoustic panels are seen folded away

THESE two conversions have two major points in common, both are small, and both required a high degree of acoustic quality. The Audley-square building had been damaged by bombing; the Soho-square basement had been a preview theatre and required considerable sound insulation, both within and in the surrounding departments, for its new role as a dubbing theatre. In the Soho-square theatre the principal method of sound correction, giving variable reverberation times, was the use of folding wall panels with acoustic board on the face. These panels, when closed, offer a hard plywood surface to the theatre; the number of panels open or closed can be altered at will for any particular acoustic affect. The extract fans have sound filters, and the lift contact panel and the motor room are heavily insulated with 2 in. of 'Rocksil'. In addition, the contact panel is set on rubber shock absorbers. An old barrel vault wine cellar was lined with 'Newtonite' lathing and hard plastered for damp protection and is used as an echo-chamber. The whole of the Soho-square theatre has foam rubber flooring. In the Audley-square conversion the projection room was made in an existing bay window, the theatre being built out into the garden. The two projectors are controllable, including reversing of the film, from a small console in the back row of the theatre. Other accommodation asked for in the Audley-square conversion, apart from the preview theatre, was for film storage, a boiler-room, lavatories and offices, with a self-contained maisonette on the second and third floors and a 'sauna' or Finnish bath.

In the preview theatre itself there is a suspended ceiling of 1 in. thick asbestos spray with extract ventilation ducting and concealed lighting above. The couches are filled with Dunlopillo and covered with natural hide, which was also used to cover the soundproof door to the theatre. This door is sound-resisting, fire-resisting and self-closing, and contains a solid core of timber with fibreglass insulation and perforated hardboard face to the corridor, the whole being framed in silver anodised aluminium.



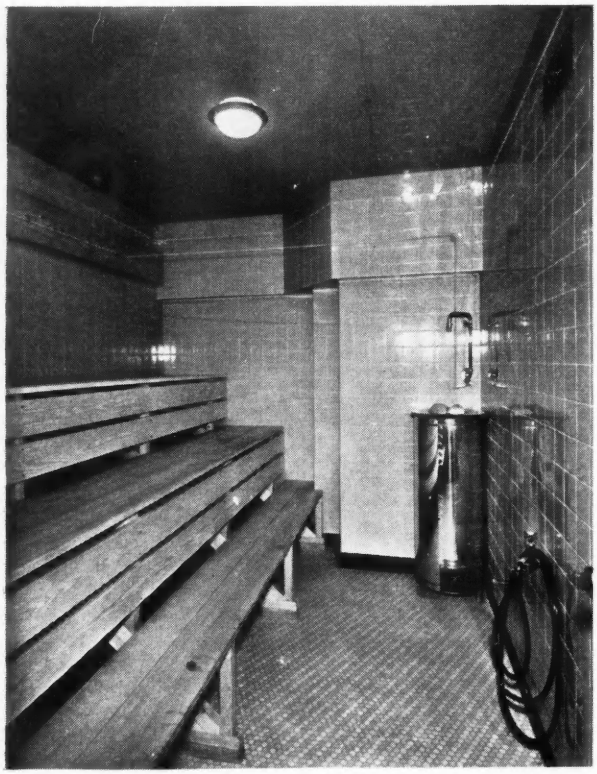


PLAN & SECTION, scale: 1 in. = 16 ft.

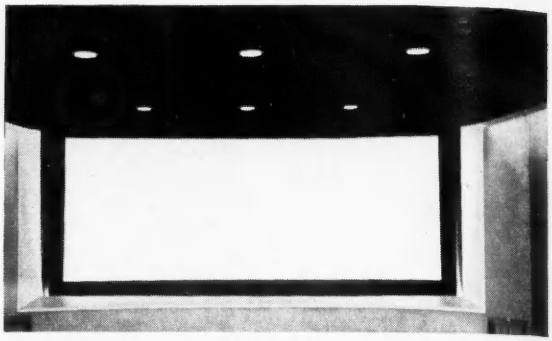
Preview Theatre, Audley Square

Subcontractors & Suppliers:—

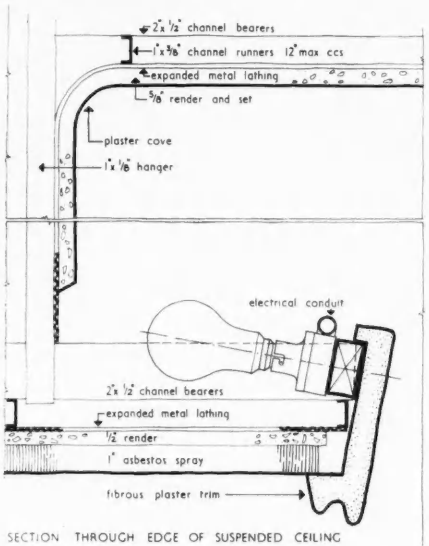
Electrical installation, Hall and Miller; special equipment, Westrex Co., Ltd.; plumbing, W. H. Gascoigne and Co., Ltd.; tile flooring, Inlaid Rubolin Flooring, Ltd.; fibrous plaster, Eaton Contractors, Ltd.; ceilings, Lumenated Ceilings, Ltd.; metal grilles, C. Aiano and Sons, Ltd.; ironmongery, Yannedis and Co., Ltd.; special joinery, Sound Cabinet Co.; asbestos spray, Newalls Insulation, Ltd.; paints, International Paints, Ltd.



The Finnish 'Sauna'

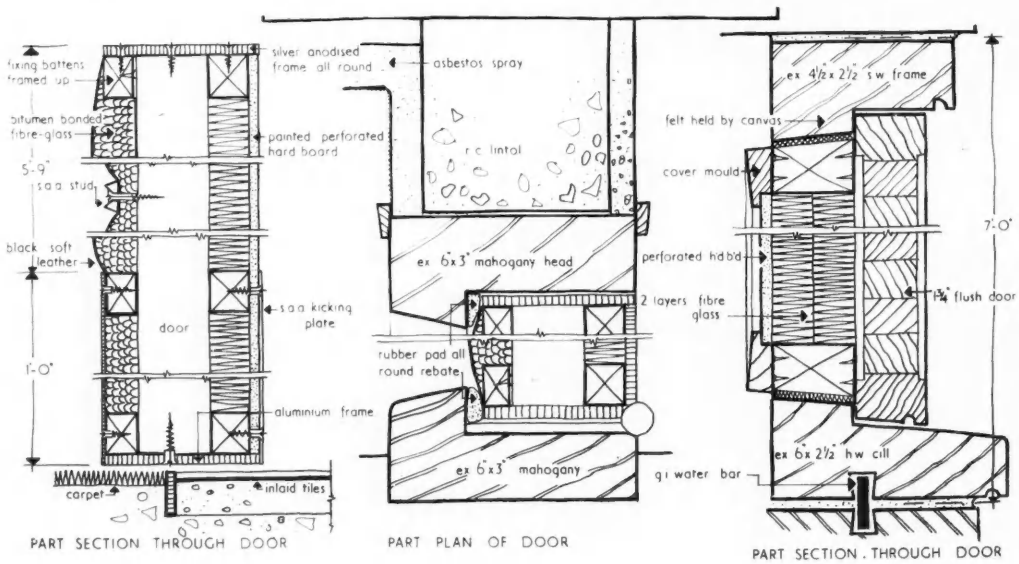


The wide screen, showing the fibrous plaster surround continuing from the suspended ceiling which contains concealed lighting, see detail below



SECTION THROUGH EDGE OF SUSPENDED CEILING

SOUND PROOF DOOR DETAIL, AUDLEY SQUARE
Scale: one quarter full size

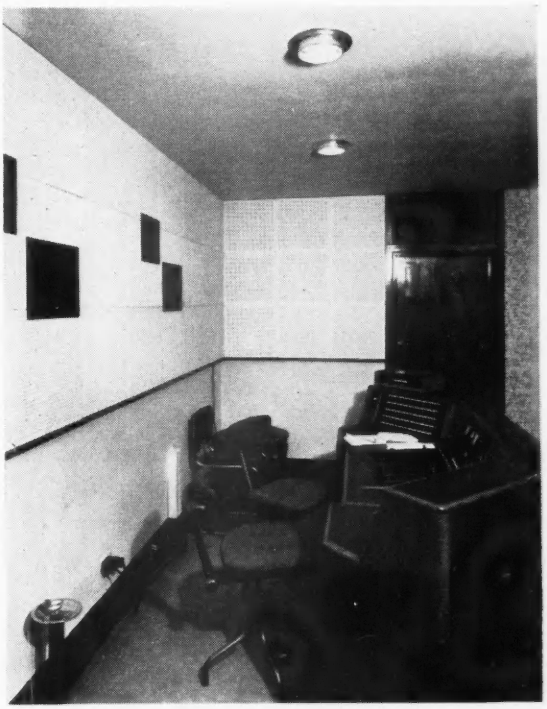


Dubbing Theatre, Soho Square

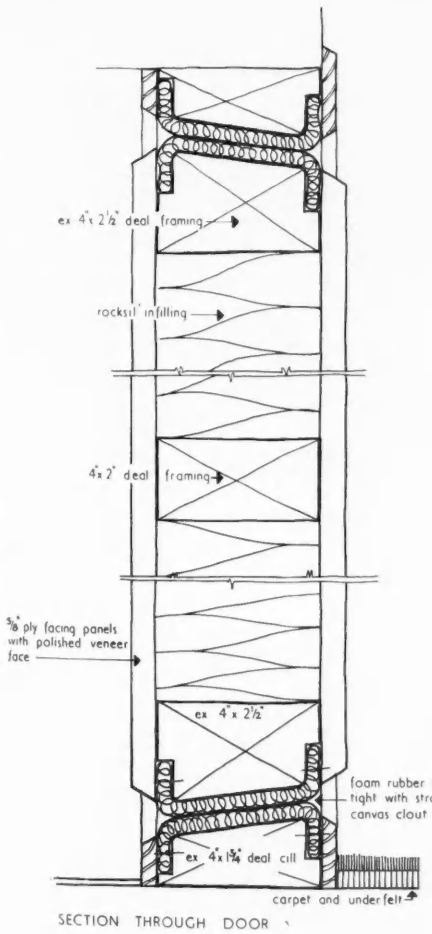
The rear of the theatre with the control console in the centre. On the right wall in the foreground is one of the folding acoustic panels, shut with polished plywood surface outside for high reverberation

Subcontractors & Suppliers:—

Electrical work, Hall and Miller; rubber flooring, Burtain, Ltd.; special equipment, Westrex Co., Ltd.; ironmongery, Yannedis and Co., Ltd.; sound insulation, Meta-Mica, Ltd.; acoustic tiling, Merchant Trading Co., Ltd.; nosings, Ferodo, Ltd.; paint, British Paints, Ltd.

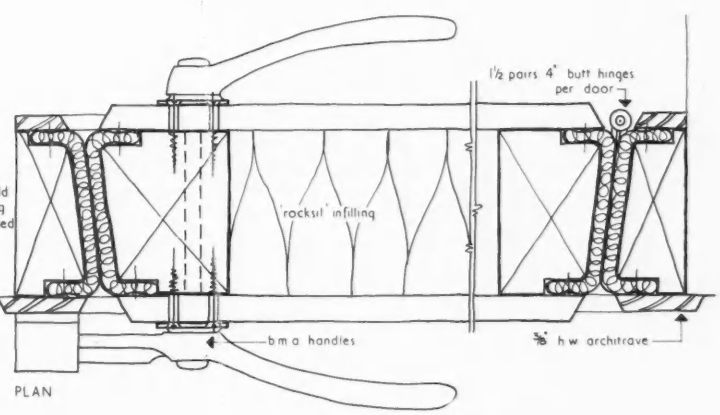


The main control console. The door in the background leads to the echo chamber under the street. Acoustic panels line the walls above the dado


ex 4" x 2½" deal framing
rocksil infilling
4" x 2" deal framing
⅝" ply facing panels with polished veneer face
ex 4" x 2½"
foam rubber held tight with strong canvas clout fixed
ex 4" x 1¾" deal cill
carpet and underfelt

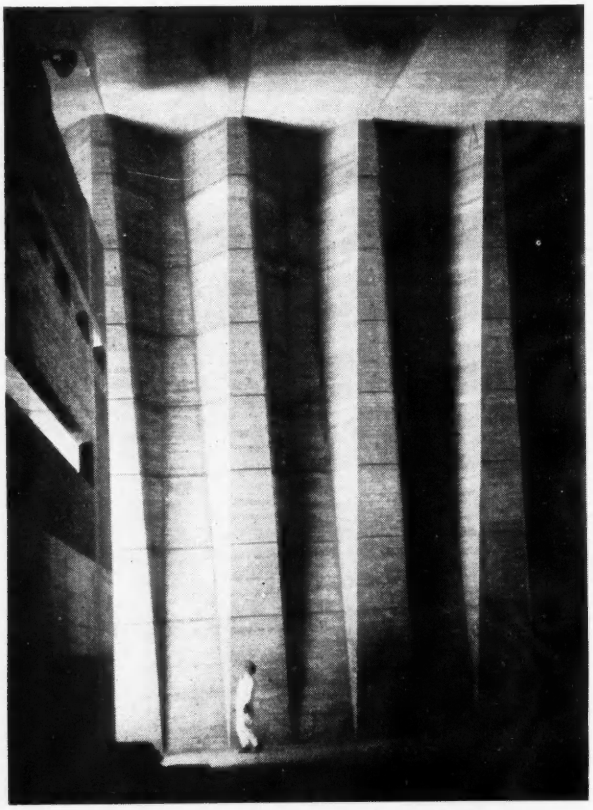
SECTION THROUGH DOOR

SOUNDPROOF DOOR DETAIL, SOHO SQUARE.
Scale: one quarter full size



PLAN

New UNESCO Headquarters in Paris



View of concrete screen in the Grand Conference Hall. Below: Detail of the facade towards the Avenue de Segur, showing brise-soleil treatment.

THE new Unesco headquarters building in Paris is nearing completion. It stands on a seven-and-a-half-acre site near the Eiffel Tower, on the left bank of the Seine.

The building is an architectural innovation for post-war Paris. The larger of the two buildings, a seven-storey, Y-shaped structure, 90 ft. high, is for Unesco staff. Supported on *pilotis*, its reinforced concrete frame is enclosed by 50,000 sq. ft. of glass in some 950 windows.

By reason of the Y-form, each of the 600 offices overlooks Paris. The ceiling of each is sound-proofed and slopes up gradually until it meets a large window. The building also houses staff meeting rooms, a medical centre, restaurant, cafeteria and bar for delegates and staff. Three systems of heating—hot water radiators, radiant heat and temperature-controlled forced ventilation —will be used to meet the needs of different areas.

In the basement are five radio and television studios, workshops, a cinema, central heating equipment, a telephone switchboard with 100 outside and 1,300 internal lines, emergency electricity plant and storerooms. Workshops, where Unesco documents and publications will be printed, cover a total floor area of 21,500 sq. ft.

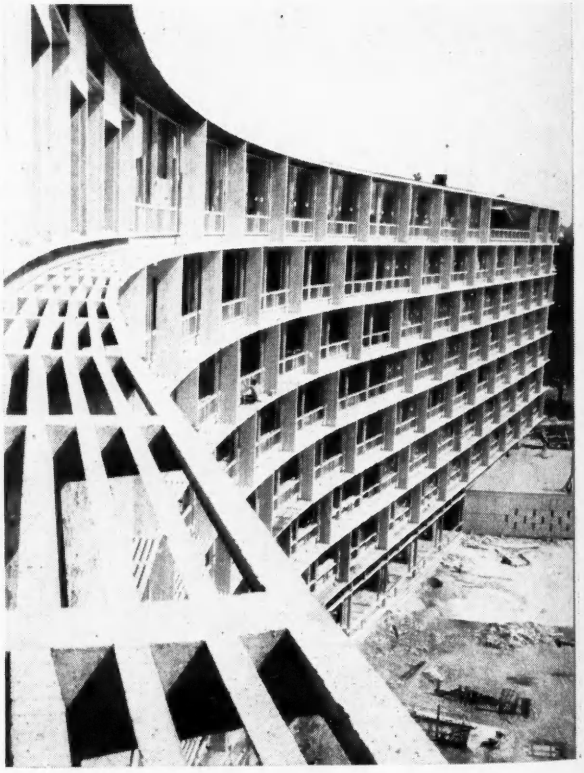
Standing in the curve of one arm of the building is the low trapezoidal structure grouping conference halls and services. The largest of its main halls seats about 700 people, including members of the public.

The new headquarters was designed by an international team of architects; Bernard Zehrfuss, of France; Pier Nervi, of Italy; and Marcel Breuer, of the United States—aided by an advisory committee of five architects: Lucia Costa (Brazil), Walter Gropius (USA), Charles le Corbusier (France), Sven Markelius (Sweden) and Ernesto Rogers (Italy). Chief engineer-in-charge of building operations on the site is the American engineer and architect, Eugene H. Callison.

The designers were required to complete the vacant half of the semi-circular Place de Fontenoy, laid out by the eighteenth-century architect, Jacques-Ange Gabriel, creator of the Paris Military College and the Petit Trianon at Versailles. They were also restricted to a height of seven storeys. The curved wings of the completed building will form three unbroken façades, one of which completes Gabriel's plan for the Place de Fontenoy.

So far, six artists with international reputations have agreed to execute work for decoration. Pablo Picasso, for example, is to produce a mural covering 1,100 sq. ft. in the Conference Building. A monumental sculpture for the main plaza will be by Henry Moore.

Floor surfaces of the two buildings add up to over seven acres, but only one-eighth of the total site is occupied by buildings, leaving room for gardens, patios and parking space for cars. The cost of construction and equipment, being carried out by firms from six countries, is covered by an interest-free loan from the French Government. Structural work on both buildings was completed last year. The installation of services and the interior decoration are due to be finished this autumn when the Unesco staff will move in.



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News of the Week

Coventry Tapestry Approved

FINAL approval was given last week to the completed design by Mr. Graham Sutherland, for the 74 ft. by 40 ft. tapestry which will hang in the new Coventry Cathedral, for which Prof. Basil Spence, OBE, ARA, FRIBA, is the architect. Weaving is expected to start early next year.

The design has been seen by members of the Cathedral Reconstruction Committee, the Cathedral Chapter, the Cathedral Council and the Christian Service Centre Joint Council, which includes Free Church members associated with the Cathedral's Chapel of Unity.

Mr. Sutherland's preliminary design and theme were approved about three years ago. Since then he has worked on the design at his home in the South of France. Weaving will take about three years and the cost will be £20,000.

IUA 'Abercrombie' Prize

THE EXECUTIVE COMMITTEE of the International Union of Architects, which met in Berlin in August, decided to institute a 'Prix d'Urbanisme' in memory of the late Sir Patrick Abercrombie, and 'Prix d'Architecture' in memory of the late Auguste Perret, the French architect.

Mr. Nelson Meredith to Retire

MR. J. NELSON MEREDITH, FRIBA, City Architect of Bristol since 1938, is to retire from the service of the Council next month. His departmental report for the year ended March 31, 1957, records a great variety of work in hand or accomplished, including the erection of the new Terminal Building at the Airport at Lulsgate, officially opened by the Duchess of Kent in May, the completion of 1,586 houses and 377 dwellings in multi-storey flats, the completion of five new schools, the putting in hand of ten other educational building projects, and much miscellaneous work besides. The cost of the department's architectural work for the year, including the appropriate proportion of administrative charges, was £102,541, and the aggregate amount paid to building contractors during the same period was £3,628,085. Architecturally the department has been responsible for £28,000,000 worth of building work since the end of the war. The report includes four pages of photographic illustrations of current work.

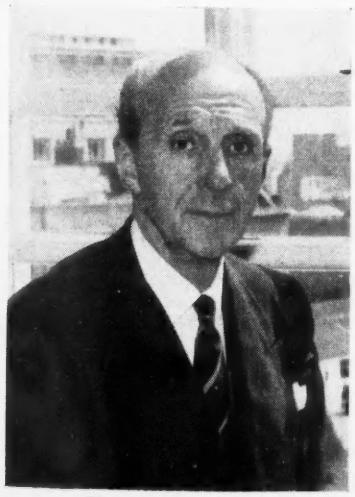


Photo by courtesy Western Daily Press

Mr. J. Nelson Meredith (see Note)

Under the direction of Mr. Nelson Meredith the City Architect's department has greatly enriched the City and County of Bristol architecturally. We wish him many years of happy retirement.

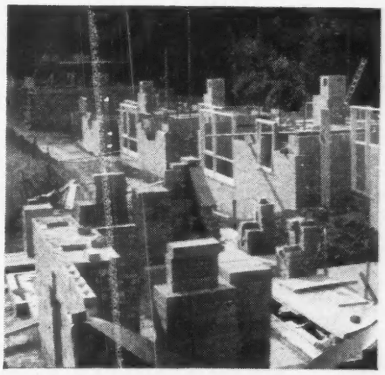
Two Major Contracts

TENDERS PUBLICLY OPENED for the building of the superstructure of the new American Embassy in Grosvenor-square, W1 (Eero Saarinen, architect; Yorke, Rosenberg and Mardall, FF.RIBA, 2, Hyde Park-place, W2, supervising architects) were as follows:

Pauling & Co., SW1	£1,754,717
Trollope & Colls, Ltd., WC2 ..	1,763,211
Wates, Ltd., SW12	1,787,966
Holland & Hannen and Cubitts, WC1	1,812,689
Higgs & Hill, Ltd., SW8	1,818,000
Griggs & Son, Ltd., SW1 ..	1,825,000
F. G. Minter, Ltd., SW1	1,829,298
Taylor Woodrow, Ltd., W1 ..	1,887,783
Gilbert-Ash, Ltd., W1	1,926,929

Bills have yet to be checked and no contract has been placed. The tenders were on a firm price basis.

Placed this week is a contract for the construction of an arch-type bridge between Runcorn and Widnes which will have the longest single span in Europe. Estimated to cost over £2m., the contract has gone to Dorman Long, of Middlesbrough.



WORK STARTED ON ABS HOMES.— A progress photograph, taken in August, showing the six bungalows on which work has started with the warden's house in the foreground. The bungalows form part of the Architects' Benevolent Society's scheme for old people's homes at East Horsley, Surrey. Mr. Clifford Culpin, FRIBA, is the architect

Repair of Ancient Buildings

THE Society for the Protection of Ancient Buildings is again providing facilities for architects and surveyors interested in and responsible for old buildings to obtain knowledge of its principles and methods of repair, and is arranging its annual course, consisting of lectures, discussions and visits, to cover the many important aspects of repair work.

The Society is anxious to secure that those dealing with old buildings should understand not only traditional constructional methods but also the principles underlying the sympathetic and conservative treatment of old buildings, whether ecclesiastical or secular. In view of the specialist nature of work of this character, the Society believes that the opportunity to study at first hand some of the problems which arise will be helpful to architects interested in this subject. It is hoped that local authorities and others will be able to give facilities to the architect members of their staff to take advantage of this scheme.

The course will be held at the Society's headquarters from October 21 to 27. Details from the Secretary, SPAB, 55, Great Ormond-street, London, WC1.

New Chairman, RFAC

LORD BRIDGES, who retired last year from the Permanent Secretaryship of the Treasury, has been appointed Chairman of the Royal Fine Art Commission in succession to Lord Crawford and Balcarres.

Retirement

MR. C. C. SHAW, FRIBA, borough architect, Barking, is to retire on October 9. He will be succeeded by his deputy, Mr. Matthew Maybury, ARIBA.

COMING EVENTS

MONDAY, SEPTEMBER 30.

FEDERATION OF PAINTING CONTRACTORS.—Annual dinner and dance. Dorchester Hotel, W1. 6.15 p.m.

TUESDAY, OCTOBER 1.

CENTRAL COUNCIL FOR THE CARE OF CHURCHES.—Exhibition of Post-war Church Building. St. George's, Bloomsbury, W1. (Open until October 14.)

INSTITUTE OF METAL FINISHING (Midland Branch).—'Architectural Colour Anodising.' By A. W. Brace and R. E. Polfreman, of Aluminium Laboratories, Limited. James Watt Memorial Institute, Birmingham. 6.30 p.m.

WEDNESDAY, OCTOBER 2.

ECCLESIOLOGICAL SOCIETY.—Annual commemoration service. Church of the Holy Trinity, with All Saints, Prince Consort-rd., SW7. 7.30 p.m.

NATIONAL SMOKE ABATEMENT SOCIETY.—24th Annual conference. White Rock Pavilion, Hastings. 10.30 a.m. (Continuing until October 4.)

FACULTY OF ARCHITECTS AND SURVEYORS (London Branch).—Annual dance. Peter Jones's Restaurant, Sloane-sq., SW1. 7.30 p.m.

FRIDAY, OCTOBER 4.

ARCHITECTS REGISTRATION COUNCIL OF THE UNITED KINGDOM.—Council meeting. 78, Wimpole-st., W1. 2.30 p.m.

BIRMINGHAM & FIVE COUNTIES ARCHITECTURAL ASSOCIATION.—'An Architect Looks at America.' By D. T. Howarth, FRIBA. Midland Institute, Paradise-st., Birmingham. 6 p.m.

ASSOCIATION OF BUILDING TECHNICIANS (London Branch).—'Building for Atomic Power.' By E. L. Ashley. Film, 'The Construction of Calder Hall.' Building Centre, Store-st., WC1. 6.30 p.m.

'SPEEDIER BUILDING NEEDED'

'Britain Still at "Muzzle Loader" Stage of Construction'

THE need for the building industry in this country to adopt more modern construction methods that would enable us to complete buildings in Britain as rapidly as they are completed in the USA, was referred to by SIR ALFRED BOSSOM, Bt, MP, FRIBA, in his presidential address to the annual conference of the Association of Public Health Inspectors, which was held at Eastbourne from September 17 to 20. Following are extracts from Sir Alfred's remarks:

Slum clearance is again being tackled with decided success. The Government aims to rehouse 200,000 slum dwellers each year during the next five years and the number of people moved into decent houses is now increasing steadily. If the nation's present plans are pursued with vigour, the 1960s should see the end of slums in Great Britain except in those more densely populated and industrial areas where the problem is particularly acute. Let us say *it must be done*.

There are also a vast number of houses which are still structurally quite sound, but which have outlived their form in certain details, being unequipped with the sanitary services and other amenities indispensable to modern living. Here again the Government has faced up to this and made provision for grants to help landlords to get their houses properly modernised. They can then let them at more economic rents which in turn will allow for the houses to be kept in good repair.

In this particular connection I should like to digress slightly and call attention to an unsatisfactory state of affairs in our building industry today. I suppose everybody in this hall has read of the announcement of the mammoth building that the Shell Oil Company propose to build on the South Bank of the Thames, and also of the 30-storey skyscraper proposed for Park-lane, which will take apparently, three to four years to build.

New York Example

Not two months ago, an old confrère of my architectural days in America, James Eli Kahn, spoke to us at the Royal Institute of British Architects, and casually mentioned how he had been the architect for a 40-storey building on Park-avenue, New York, which had been completed in eight months. What a commentary this is upon the methods which we have allowed to ingratiate themselves into our building procedures, to our great disadvantage.

A typical building of this kind should earn enough to pay for its cost of construction in from 15 to 20 years, in England or America, if properly designed and scientifically built. But what does this comparison prove?—That in the United States a building is put up two to three years more quickly than a similar one would be here, so that it starts to earn that much sooner and is therefore free and clear from all indebtedness in 15 to 20 per cent. less time after its completion than such a building in this country.

This is well worth studying. We take great care to ensure that we get first-class buildings—and we do, there is no doubt about that. Well, so do the Americans.

We must remember that Great Britain spends something like £2,000m. a year on building and civil engineering, one of the largest claims on our national income. This, of course, includes an infinite number of structures in addition to housing, but if we could, by modernising our methods, save from 10 to 20 per cent. in this annual building bill, it would make a very satisfactory contribution towards the reduction of the nation's expenses.

We have undoubtedly as good designers as any in the world, and our mechanics are second to none, but we are still in many instances at the muzzle loader stage in speed of construction. We have the knowledge of air conditioning, ventilation, electric equipment, steel framing, mechanical installations, used by the leading countries of the world, but I fear we are not always quick in adopting any new practices.

Surely the time is *now* when it would be appropriate for the Government or independent bodies like your own, to set up a joint investigating committee with representatives from the Ministry of Works, the local authorities, your own Association and all kindred groups, to see why we cannot take a firm grasp of this situation, to the endless benefit of everyone.

COMPETITION NEWS

International Competition for New City Hall and Square, Toronto

AN international competition for a new City Hall and Square for Toronto, Canada, is announced. The competition is approved by the International Union of Architects and will be in two stages. At the end of the first stage, eight competitors will be selected to compete in the second stage, at the end of which each will be paid $7,500. The winner will be the architect for the building and will receive $25,000 in advance of fees which are set at 6 per cent. of the cost of the building.

The City of Toronto has not set a limit to cost, but estimates have been discussed up to $18m.

Professor Eric Arthur, MA, FRAIC, FRIBA, has been appointed professional adviser by the city and has drawn up the conditions of the competition approved by the city. Copies may be obtained from him c/o City Hall, Toronto, Canada, for a fee of $5 or its equivalent. This amount will be returned to architects who submit *bona fide* drawings for the competition.

The jury, all of whom are architects, is a distinguished one consisting of the following: (1) Sir Wm. Holford, architect and town planner, London, England; (2) C. E. Pratt, architect, Vancouver, BC, Canada; (3) Ernesto Rogers, architect, Milan, Italy; (4) Eero Saarinen, architect, Bloomfield Hills, Michigan, USA; (5) Gordon Stephenson, architect and town planner, Toronto, Canada.

Interested competitors should write Professor Arthur by airmail. It is expected that the conditions of competition should now be available.

RIBA

Archibald Dawnay Trust Prizes, 1957

THE Board of Architectural Education announce that the RIBA (Archibald Dawnay) Trust Prizes for 1957 have been awarded as follows:—

A prize of £100 to G. L. BRUCE, of the School of Architecture, Edinburgh College of Art.

A prize of £100 to THOMAS HENNEY, of the School of Architecture, Edinburgh College of Art.

A prize of £100 to I. R. TURNER, of the Nottingham School of Architecture.

A renewal of the prize of £60 awarded for the session 1956-57 to J. A. DALTON, of the Architectural Association School of Architecture.

A renewal of the prize of £60 awarded for the session 1956-57 to ANTHONY EARDLEY, of the Architectural Association School of Architecture.

A renewal of the prize of £60 awarded for the session 1956-57 to J. H. WILLIAMS, of the Birmingham School of Architecture.

OBITUARY

Lieut.-Col. George O. Scorer, FRIBA

WE REGRET to announce the death, at Epsom, on September 22, of Lieut.-Col. George Oakley Scorer, FRIBA. His architectural education began at the S. Kensington School of Art, and he was subsequently articled to R. Selden Wornum, FRIBA; he also attended the AA Schools.

He was elected ARIBA in 1895 and FRIBA in 1913. He was appointed first Inspector of Works to the Imperial War Graves Commission, France, 1918-19. His earlier works include a house at Rotterdam for S. Van den Bergh; works for De Dion Bouton, Ltd., 1913-14; premises at Grays for Grays and Tilbury Gas Co., 1913-14; and 'Dainsu,' Brancaster.

Harold Moss, FRIBA, FILA

MR. HAROLD E. MOSS died on September 20 at Boundary Lodge, Kingston Hill, after a short illness. He was 69 years old.

FROM 'THE BUILDER' OF 1857

Saturday, September 26, 1857

CANTERBURY'S MUNICIPAL RECORDS.—About 1481, the regular wages of a tiler were 4d. a day. In 1520, we find that a tiler was paid 5d. a day. In the chamberlain's accounts for 1546, we have the following items: 'First, payd to Thomas Graves, tyler and hys man, for x days tyling about the halle and the chambers, tackying by the day for mete, drynk, and wages, xijd xs. Item, paid to carpenter for one day's work, mendying the windows, and the stayers of the same tenement, viijd. Item, paid to a dawber and his man for two days dawbying of the walles of the same house, xijd the day, ijs.

Professional Announcements

MR. JOHN E. MYERS, ARICS, chartered quantity surveyor, has transferred his offices from 18, High-street, Stockton-on-Tees, to 20, Finkle-street, Stockton-on-Tees (tel. unchanged —Stockton 66206).

MR. B. W. ELLIS, chartered quantity surveyor, has moved his office to 90, Mansel-street, Swansea (tel.: Swansea 54323).

MESSRS. F. M. GOODHEAD & PARTNERS, quantity surveyors, of 40, Craven-road, W2, have opened an office at 12, High-street, Rochester, Kent (tel. : Chatham 45532), in the charge of a partner, MR. H. W. CALVER, ARICS Current trade catalogues will be appreciated.

'THE BEST OF BOTH WORLDS'

Sir William Holford's Address at the Housing Centre

IMMEDIATELY following the annual general meeting of the Housing Centre, over which he presided on September 17, PROFESSOR SIR WILLIAM HOLFORD, FRIBA, the president, delivered an address on planning and housing which he entitled 'The Best of Both Worlds: Decentralisation and Redevelopment as a Combined Operation.' He claimed to have reached the same conclusions as Mr. Peter Self in his book, *Cities in Flood*, although he had made a different approach to the subject.

Sir William announced his intention of making a general proposition about the future of housing, planning, building and the preservation of the countryside. It was, he said, based on the idea that we, in these islands, could rid ourselves of certain fears and inhibitions and the thoughtless acceptance of things as they are. We could quite literally make the best of both worlds.

The kind of planning he was thinking about was not in the least authoritarian; rather the contrary. To be successful it needed certain conditions, which Sir William proceeded to enumerate.

The first was an intelligent capacity to anticipate change. A simple example was the ability to design our streets and roads and garages for traffic as it will be in ten years' time and not for traffic as it was before the war, which was the common method, not so much among designers as among administrators and politicians.

The second condition was an appreciation of design. By this he meant the power of the artist, craftsman and engineer to make out of ordinary subjects an extraordinary stimulus, to make architecture out of building, landscape out of carriageways and planting and a composition out of a collection of houses.

The third condition was what used to be called a discipline. By that he did not mean a tendency to stand in queues or a sense of fair shares for all leading to such ideas as that every house must be fit for televiewers to live in, every main thoroughfare must have Grade A lighting so that you could read a newspaper in the middle of it (and he had met a man who made just that suggestion) or that every town must have its ring road. He meant partly what the ancient Greeks recognised in their *polis*, or city community, namely, the importance of doing without certain things so as to leave time and room for what they considered essential, such as conversation, argument, exercise or the theatre.

Limits to Unity

This implied that every unity had its limits. When a *polis* became too big it was no longer a *polis* and so hived off to a colony, perhaps on the other side of the Mediterranean. Partly also, said Sir William, he meant the discipline of economy, an understanding of the minimum standards of to-day that were everyone's right and of the luxuries that had to be paid for specifically.

The last condition, and to his mind the most important, was awareness of the nature of variation. Surely the essence of planning was to differentiate. The intelligence test for a town planner was not to arrange all his buildings in an orderly row in the shortest possible time but to make an interesting, useful and individual composition of them. Regulation was necessary for planning, but planning could not be effective by regulation.

We all knew this, but we were so often off our guard in our criticisms of particular proposals. A local authority with nothing but standard three-bedroom houses wanted to build one- and two-bedroom flats and incurred official disapproval as well as moral objection from people who were quite unconnected with the locality. Someone had objected to his scheme for the surroundings of St. Paul's by saying it was peculiar to London and London, of course, got everything. There seemed to be a general reluctance to concede metropolitan values to the metropolis or New Town values to a New Town, the idea being that 'they ought to find their place in the queue with other local authorities.'

'Beyond Party Politics'

Yet all the things we cared for in our environment were made up of varied and sometimes most surprising elements which together formed a unity with a special character of its own. Sir William instanced as examples of this a region like Snowdonia, a Metropolitan Borough like Lambeth or Hampstead, a townscape like Regent's Park, a great country house like Blenheim Palace or a single building like the Banqueting Hall in Whitehall.

He believed that all these conditions of successful planning were obtainable in post-war Britain, but were seldom brought to bear on the same problem at the same time. There seemed to be a distrust of agreement itself. Planning was a highly political activity and yet most of the business and objectives of town and country planning in this country were beyond party politics. More often than not the contest itself became more important than the issues at stake. Attitudes were taken up and, in the case of local government disputes, might be retained indefinitely.

For some, if not most, types of planing agreement was essential to progress. Obsolescence and decay, poverty and overcrowding were the real opposition and yet we took sides for and against decentralisation, for and against flats, for and against motorways, as if our lives depended on it.

Before making some suggestions on the subject of urban spread and urban check —or, as jargon had it, decentralisation and redevelopment—Sir William said nobody could deny that this was one of the great problems of our day. He then quoted from Mr. Peter Self's book, in a passage where the author referred to the dilemma presented by the need to reduce the populations of the largest cities, leading to the creation of new urban communities outside those towns, while at the same time other people entered the large cities to take over the employment of those who had transferred their homes and work to the new communities.

If he read Mr. Self's conclusion aright, said Sir William, Mr. Self also looked in the direction of a 'combined operation' to ease the situation.

As a convinced urbanist he (Sir William) was bound to approach a city first of all from the standpoint of design. 'Does it look right?' he would ask. This approach, although it had its obvious limitations, at least avoided analysing the case history on the basis of preconceived moral judgments. To the designer, quality was more important than quantity. Scale and proportion and comprehension of the whole were more important to him than size. To him London was, unlike to Cobbett, not a 'great amorphous wen,' it was a commercial city, an administrative city and a group of urban villages.

So he was not shocked at the evidence which came from all sides to the effect that more and more people went to work, or had to work in London, or that agricultural employment was declining or that the average household in England and Wales was smaller than it once was. The planner's task was to make virtue out of these necessities. The real tragedy was when these changes brought with them a hopeless deterioration in the quality of an environment, whether urban or rural.

Sir William drew attention to the fact that in the ancient world it was the cities that were physically destroyed and quoted *Carthage delenda est*, but in the modern world cities physically endured (and he believed they would do so even in the age of the hydrogen bomb) and it was the countryside that was physically destroyed. He had often thought the real aim of countryside preservation was to make it too valuable to destroy. In other words, it might be the heedless and inefficient use of rural land, and not its careful and purposeful use, which was the real enemy.

Newer Barbican Scheme

As a corollary we might make metropolitan areas more and not less metropolitan. The City of London could not build to the standards of a garden city, but there was no good reason why it should not have metropolitan centres of residence as well as the headquarters of financial and shipping firms and a concentration of commodity markets. In fact, the Newer Barbican scheme was an admirable essay in that direction.

Commenting on that scheme, Sir William said the rent estimates were low and might have to be revised. The policy underlying the scheme was the reversal of a trend which had existed since the days of the first Elizabeth, when people started to move out of the City. It would mean that on those 25 acres, where people would otherwise be working in offices, they would be living at 900 to the acre. He did not believe the demand for office accommodation in central London showed any signs of abating, but the

scheme would set a check on the creation of about 10,000 extra occupations in that area.

He pointed out that many industries had started in London on a very small scale in backyards or under the railway bridges on the South Bank and had grown up into flourishing concerns. It was natural for a big city to provide some kind of ground for such activity, but after the early stages it was doubtful if London was the right place for these industries. It was difficult to ration and select and keep everything out of the central area except what ought to be there, but this was the policy which ought to be followed rather than purely commercial cutting down. It could be achieved by measures such as the LCC had introduced.

Cities should not usefully grow beyond a certain size. Sir William instanced Cambridge, which, if it were to grow to twice its present size, would bring no advantages to the ordinary citizen, but many disadvantages. The city might gain in rateable value and power in the local government world, but it would lose the qualities of a university city. Cambridge had therefore set a limit on its development and was the only town apart from Welwyn, Letchworth and (to a doubtful extent) the New Towns, which had done so.

But he believed that, from the designer's point of view, the size of a city held no terrors in itself. What mattered was that things should be in proportion. The same consideration should be given to large towns and conurbations as to villages. London's problems were not insoluble, but we should think in terms of quality and specialisation rather than quantity and not embark on fruitless controversies.

The Annual Report

IN THE annual report of the Housing Centre it was stated that membership had again increased. In addition to the discussion meetings, the annual conference and a study tour of a party of members to Holland this summer, useful services had continued to be provided to many people interested in housing.

Commenting on the Rent Act, the report stated this was welcomed by the Housing Centre, but the introduction of the measure had coincided with credit restrictions which had made housing progress more difficult in all fields, while pressure for accommodation continued to be heavy in certain areas. The Centre's general committee had felt very apprehensive about the complete decontrol of so many dwellings in London and similar areas and a letter had been sent to the Minister to that effect. Subsequently some further safeguards ensuring that rent increases and action to obtain possession could not occur precipitately had mitigated the Housing Centre's fears.

Urban development, including slum clearance and redevelopment, was likely to remain the focus of the Centre's activities during the coming year, although the many special interests of members in such matters as housing old and single people, rehabilitation of unsatisfactory tenants, neighbourhood planning and facilities, improvements and conversions would not be neglected.

The fall in space standards of dwellings was grave and this aspect of costs and subsidy policy should receive greater attention. The Centre's interest in the aesthetics of housing continued.

Election of Officers

The following officers were elected: President, Sir William Holford; chairman, Miss J. G. Ledeboer, FRIBA.; hon. treasurer, Mr. S. Pointon Taylor, FRIBA, MTPI,; hon solicitor, Mr. Ambrose Appelbe.

BUILDING IN THE CITY

£17m. Barbican Residential Plan Accepted

MOVING the adoption of proposals for the residential development of the Barbican, MR. T. C. COLLETT told the Court of Common Council at their meeting at Guildhall on September 19: 'It will be the largest single contribution to the relief of congestion in central London, would counteract the westward drift of commerce and business, take a small, but definite step forward towards easing the burdens and problems of travel to work and begin to restore the balance of residential and working population in the City.'

The Court overwhelmingly accepted the report of the special committee, of which Mr. Collett is chairman, which drew up the plan and recommended that the question of the residential scheme should be referred to a new 'Barbican Committee.'

At a capital cost of £17m., the scheme provides for a 'genuine residential neighbourhood' with flats for the middle and higher income groups.

It also provides sites for the City of London School for Girls and the Guildhall School of Music and Drama.

Mr. Collett referred to the scheme as 'a bold, imaginative and courageous stroke.'

He declared: 'Whatever plan may be finally adopted, we feel sure that Barbican must be treated as a residential area. Scattered and piecemeal development must be discouraged.'

Supporting the proposals, CAPTAIN ALFRED INSTONE made the reservation that he thought provision should be made for people of all incomes instead of only the middle and higher income groups.

SIR SYDNEY FOX criticised the 'three tall blocks' planned for the site, which, he said, were each twice as high as the highest blocks on the Corporation's nearby Golden-lane development.

He said the proposals would cost at least £20m. and might 'saddle the City of London with the biggest white elephant it has ever had.' There was a strong bias in the proposals, he said, for the scheme of Messrs. Chamberlin, Powell and Bon, but he moved that the town planning committee should proceed with a scheme based on the Martin-Mealand plan, with modifications for residential accommodation through housing associations. This was defeated.

MAJOR S. E. SANDAL referred to the proposals as 'a speculative scheme of building at the ratepayers' expense,' and said that there was at present no ascertained demand for the accommodation they were going to provide. He moved an amendment seeking the reference back of the report so that the financial estimates could be revised, but this was also defeated.

Projects Approved

The Improvements and Town Planning Committee, whose report was approved, said the following developments had been permitted subject to certain conditions:

Erection of a new building to house the overseas branch of Midland Bank Ltd., and three retail shops, at parts of 59, 60, 61, 62 63, 64 and 65a, Gracechurch-street and 1a, 1b, 2, 3 and 4 Fenchurch-street (Whinney, Son and Austen Hall, FF/ARIBA, 37, Norfolk-street, WC2); the erection of an office building with three retail shops, a public house and a bank on the ground floor at 24 to 32, King William-street, 3 to 16, Crooked-lane, 2, Arthur-street and Crooked-lane (Knapton and Deane, FRIBA, 6, Martin-lane, EC4); the erection of an office building including a licensed premises, a bank and a retail shop at 10, 11 and 12, New Bridge-street, 1, Bridewell-place and 14, Bride-lane (Shingler and Risdon, FRIBA, 47, Bedford-row, WC1); erection of a five-storey office building with a basement at 8 and 9, New-street; erection of a building comprising lower ground floor, upper ground floor and six floors over for use as offices and for packing and unpacking, receipt and despatch, etc., with tank and lift motor rooms on the seventh floor and boiler and oil fuel tanks in the basement at 20 to 34, St. Bride-street and 28, Stonecutter-street (T. P. Bennett and Son, FF/ARIBA, 43, Bloomsbury-square, WC1); erection of a five-storey office building with a basement at 36, 37 and 38, Botolph-lane (London Investment and Mortgage, Ltd., 18, Upper Brook-street, W1); erection of a new office building, with shops on the ground floor fronting Cheapside, Bow Churchyard and Bread-street, including a car park in the basement, at 46 to 55, Cheapside, 51 to 66, Bread-street, 78, 79 and 79a, Watling-street, 1 to 4, and parts of 7 and 8, Bow Churchyard and Star Court (Cotton, Ballard and Blow, 5 Baker-street, W1); erection of a new building for use as offices at parts of 5 to 8, Bow Churchyard, 78, Watling-street, 58

'Wonderful shootin' country, Sir! I've just bagged a brace of grouse and a town-planner!'

to 60, Bread-street and Star Court (Ley Colbeck and Co.); erection of a new building, comprising basement for use as storage, ground floor for use as offices and five storeys over for use as offices, the new building incorporating the existing structure known as 12 and 13, Addle-street (Montague Evans and Son); erection of a five-storey office block at 11, 12 and 13 Crosswall and 33 to 41 (odd), Vine-street (Knapton and Deane, FRIBA, 6, Martin-lane, EC4).

Outline applications on which permission was granted, subject to conditions, related to the erection of a headquarters' building for the London Salvage Corps, including offices, an appliance room, workshops, recreation rooms, senior officers' flats, etc., at 89 to 92, Long-lane, 136 to 145 and 145a, Aldersgate-street, and sites fronting Newbury-street and Cloth Fair (Powell and Brooks); rebuilding for use as offices, with the elevation matching the rest of the terrace, at 10 and 11, The Crescent, Minories (Seely and Paget, F/LRIBA, Cloth Fair, EC1); and the erection of a new building for use as offices at part of 17½ and part of Brewers' Hall, Addle-street, 22, part of 23, 24, 25, 26, 28, 29 and 51 to 58, Aldermanbury, part of 1 to 3, 2 to 4, and 5, Aldermanbury Buildings, part of 67 and 68, 65 and 66, Basinghall-street, part of 1, 3 and 4, 5 and 6, and 7, St. Georges-avenue, and St. Georges-place (Carl Fisher, FRIBA, 56, Portland-place, W1).

The Committee recommended refusal of permission for the rebuilding after war damage of a single-storey building at the rear of 19 and 20, Aldgate High-street, together with a small addition.

Drawings were approved: in respect of the erection of a seven-storey building with basement and sub-basement (Campbell Jones and Sons, FF.RIBA, 3, Budge-row EC4), at 2 to 4, Eastcheap; reinstatement for use as offices, following war damage at 90 and 91, Wood-street (Gunton & Gunton, FF.RIBA, Empire House, St. Martin's-le-Grand, EC1); erection of a building comprising basement, ground and four upper floors and linking with the existing premises in Fetter-lane for use as garaging in the basement and ground floor with offices on the upper floors, at 54 and 55, Fetter-lane, part of 12, 13, 14 and 15, and part of 16, Bartletts Buildings, and 9 and part of 11, Plough-place (W. H. Smith and Son, Ltd., Portugal-street, WC2); remodelling of the existing (private) covered roadway to form an entrance hall and the installation of a new shop front at 90 to 93, Fenchurch-street (City of London Real Property, Ltd., 16, Mark-lane, EC3); and erection of a 10-storey office building with a bank and shops on the ground floor and a basement car park at 134 to 147, Cheapside, 45 to 48, Gutter-lane, 1 and 2, Foster-lane, and part of the site of Saddlers' Hall (Theo H. Birks, FRIBA, 38, Portland-place, W1). In all these cases permission for development had been granted previously.

Development was permitted, subject to conditions, in accordance with plans submitted, for the following: erection of a new building for use as offices at 30 to 34, Moorgate (T. P. Bennett and Son, FF/ARIBA); erection of a new building for use as shops on the ground floor and a basement, with offices on the upper floors at 29 to 39, Moorfields, 27, White-street, and 2 to 4 Tenter-street (Messrs. Joseph, FF.RIBA, 10, Lowndes-square SW1).

LONDON-YORKSHIRE MOTORWAY

Construction to Start Early Next Year

WITHIN the next few weeks the Minister of Transport and Civil Aviation will invite tenders for the construction of the first 53 miles of the London-Yorkshire Motorway, from a point just south of Luton to Dunchurch, near Rugby. There will be four contracts, each for a length of between 12 and 16 miles, and work under each contract is scheduled to start next March. Contractors will be invited to submit alternative tenders for completion by either October, 1959, or October, 1960.

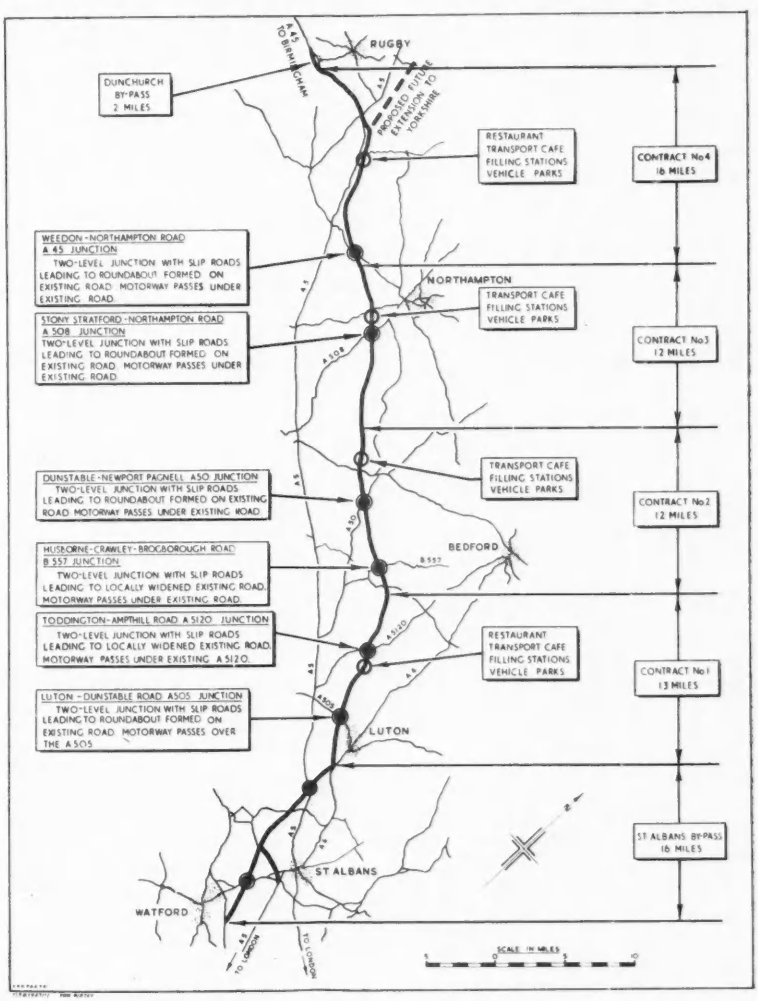
At the same time the Hertfordshire County Council, acting as agents for the Minister, will invite tenders for building the St. Albans By-pass which will link the southern end of the motorway with improved approaches to London. The St. Albans By-pass, over 16 miles long, will be built to motorway standards with all access strictly controlled.

The motorway for traffic between London and Birmingham will be the first full-length motorway to be built in this country and the first new national highway on this scale to be built on virgin soil in the present century. The motorway will fly over or under existing roads. At a few places, where especially important highways are crossed, slip roads will connect the motorway to the existing roads.

'Service Areas'

Plans for the London-Birmingham length include 'service areas' at intervals of about 12 miles. The areas will extend on both sides of the motorway and a footbridge will be built in each case to allow people to pass from one side to the other. Within these areas, which will be roughly circular in layout will be provided all the facilities that a traveller is likely to need, such as petrol-filling stations, parking areas for lorries and cars, picnic sites, transport cafes and restaurants, toilet accommodation and telephones. Not all these facilities will be provided immediately at every site; the intention is that they should be developed as the need arises.

Some idea of the work involved in build-


A45 TO BIRMINGHAM
RUGBY
DUNCHURCH BY-PASS 2 MILES
PROPOSED FUTURE EXTENSION TO YORKSHIRE
RESTAURANT TRANSPORT CAFE FILLING STATIONS VEHICLE PARKS
CONTRACT No.4 16 MILES
WEEDON - NORTHAMPTON ROAD A 45 JUNCTION
TWO-LEVEL JUNCTION WITH SLIP ROADS LEADING TO ROUNDABOUT FORMED ON EXISTING ROAD. MOTORWAY PASSES UNDER EXISTING ROAD.
NORTHAMPTON
TRANSPORT CAFE FILLING STATIONS VEHICLE PARKS
STONY STRATFORD - NORTHAMPTON ROAD A 508 JUNCTION
TWO-LEVEL JUNCTION WITH SLIP ROADS LEADING TO ROUNDABOUT FORMED ON EXISTING ROAD. MOTORWAY PASSES UNDER EXISTING ROAD.
A 508
CONTRACT No.3 12 MILES
TRANSPORT CAFE FILLING STATIONS VEHICLE PARKS
DUNSTABLE - NEWPORT PAGNELL A 50 JUNCTION
TWO-LEVEL JUNCTION WITH SLIP ROADS LEADING TO ROUNDABOUT FORMED ON EXISTING ROAD. MOTORWAY PASSES UNDER EXISTING ROAD.
A 50
CONTRACT No.2 12 MILES
HUSBORNE - CRAWLEY - BROGBOROUGH ROAD B 557 JUNCTION
TWO-LEVEL JUNCTION WITH SLIP ROADS LEADING TO LOCALLY WIDENED EXISTING ROAD. MOTORWAY PASSES UNDER EXISTING ROAD.
BEDFORD
B 557
TODDINGTON - AMPTHILL ROAD A 5120 JUNCTION
TWO-LEVEL JUNCTION WITH SLIP ROADS LEADING TO LOCALLY WIDENED EXISTING ROAD. MOTORWAY PASSES UNDER EXISTING A 5120.
A 5120
RESTAURANT TRANSPORT CAFE FILLING STATIONS VEHICLE PARKS
CONTRACT No.1 13 MILES
LUTON - DUNSTABLE ROAD A 505 JUNCTION
TWO-LEVEL JUNCTION WITH SLIP ROADS LEADING TO ROUNDABOUT FORMED ON EXISTING ROAD. MOTORWAY PASSES OVER THE A 505.
A 505
LUTON
ST ALBANS BY-PASS 16 MILES
ST ALBANS
WATFORD
TO LONDON
TO LONDON
SCALE IN MILES

LONDON-YORKSHIRE MOTORWAY (first section) and St. Albans and Dunchurch By-Passes, 71 miles.

ing the first part of the motorway may be formed from the following facts: In each of the four sections it will be necessary to excavate about 2,500,000 cu. yd. and surface about 600,000 sq. yd. Each section will also require about 75,000 cu. yd. of concrete for bridge works and about 3,000 tons of steel for reinforcing. Altogether there will be six two-level junctions, 46 bridges over public roads, eight railway bridges, three canal bridges, five river bridges and many smaller bridges for public paths, private and agricultural access.

Vehicles will not be allowed to wait on the carriageway, but if it is necessary for drivers to stop in an emergency, they will be able to run their vehicles on the verges of the road, where 'hard shoulders' are to be built.

The consulting engineers for the scheme are Sir Owen Williams and Partners.

Landscaping of the motorway has been considered from the earliest stage and the route was devised to reduce as far as possible severance of good agricultural land or encroachment on natural beauty spots. A scheme of planting, carefully designed to fit in with the surroundings, has been prepared by a landscape consultant, and a wide variety of trees and shrubs will be planted. The Minister is being advised by a specially appointed Landscape Advisory Committee under the chairmanship of the Hon. David Bowes-Lyon.

St. Albans By-pass

Work on the St. Albans By-pass is scheduled to start and finish at about the same time as work on the first section of the motorway.

The line of the proposed road begins at a point on the North Orbital Road (A.405) south of St. Albans and ends on the London-Glasgow Trunk Road, A.6, at Kidney Wood, Luton. Near this point it joins the London-Yorkshire Motorway. There will also be a branch to the Watford By-pass, A.41.

There will be seven junctions on the by-pass. Four of these, including that with the motorway will be fly-overs; the others will be surface roundabouts, to be built at the three terminal points. The scheme will include 39 bridges to be constructed in reinforced concrete to designs approved by the Royal Fine Art Commission.

As in the case of the motorway, the plans include a servicing station and other facilities for travellers.

Hertfordshire County Council are preparing the contracts, although some of the bridges are being designed by Sir Owen Williams and Partners.

HOW THEY BUILD IN BERLIN

Master Builders Must Have Eleven Years' Training

The following article is by Mr. P. A. A. Gatehouse, Secretary of the LMBA North-Eastern Area, who accompanied the LMBA party on its recent visit to Interbau, the International Building Exhibition in Berlin.

WEST BERLIN, isolated from the Federal Republic and surrounded by diametrically opposed political forces, is a prosperous city. One cannot fail to be impressed by the confidence of Berliners in themselves and their pride of achievement. They like to tell visitors what they have accomplished since 1950 when they began practical re-building. They were unable to start before this owing to political differences among the four big powers and the blockading of the city by the USSR resulting in the famous air-lift.

The Hansa district, which was almost totally devastated during the war and is now in various stages of being rebuilt, was designated as the Exhibition. After the City Council had accepted a sketch plan for the area, the Hansa Quarter Reconstruction Company was founded in 1954 and entrusted with re-building the locality housing a population of 4,500 as against 5,000 before the war.

First, the Company had to acquire the 160 privately owned plots of land, of which only ten could not be bought outright. Next, architects from 13 countries, including Germany, were invited to submit designs for various projects. They included Alvar Aalto, Finland; Luciano Baldessari, Italy; Alexander Klein, Israel; Oscar Niemeyer, Filho, Brazil; and F. R. S. Yorke, England. A German architect was seconded to each foreign architect, and in the main they have supervised the construction. When the Exhibition opened in July, one third of the district had been completely rebuilt, the remaining two-thirds being in various stages of construction though some of the projects had not been started.

Although the Reconstruction Company was an agency of the City Senate, no construction of any project was started until a buyer had been found. Berlin is a practical demonstration of what private enterprise can do. Local authority house-building is unknown. Every encouragement is given to private builders. The City Senate lend 35 per cent. of the cost of any project on condition that the owner can provide a cash deposit of 15 per cent. of the total cost and can obtain the remainder through other sources. The rates of interest charged by the Senate are extremely low; less than 1 per cent. is not uncommon.

As far as I was able to ascertain, the only condition laid down by the Senate in connection with the letting of flats and/or their sale by the property owning company was that the salary of the occupants should not exceed approximately £750 per year. People in higher salary scales have perforce to buy their houses.

Owing to the sandy nature of the soil of Berlin it is not possible to build blocks of flats of more than 17 storeys. One such block designed by two Berlin architects, Prof. Klaus Muller-Rehm and Gerhard Siegmann, has one-room bachelor flats. Each of the 173 flats contains a small cooking space, built-in bathroom and storage room, and each has a balcony. When any of the tenants marry they have to find alternative accommodation.

The building is H-shaped. External and internal load-bearing walls are of in-situ concrete, and the external pre-fabricated non-load-bearing walls and internal partitions are un-plastered. In fact, no plaster has been used in this block. The centre of the building is the stair well, which is principally for escape in the event of fire, the intention being that all movement shall be by lifts. Like all other blocks this building is connected to the district heating system, and because of the lower rates for electricity during off peak hours, the building is heated during the night.

Oscar Niemeyer of Brazil designed an eight-storey block of flats, and the lift for this building, which is triangular in shape, projects from the main structure. The lift stops at two floors only. The flats consist of two, three and four rooms, living rooms and kitchens face west, and bedrooms east; each flat has a balcony. With the exception of two-roomed flats, the WC is separate from the bathroom.

The Corbusier block of 572 flats, 17 storeys high, was too big for the Hansa quarter, and is being built close to the Olympic Stadium. This is the biggest single housing project in Berlin and is completely self-contained. It has its own electricity generating station, water works, laundry, post office, kindergarten, doctor's surgery, lawyer's office and shops.

On Two Levels

The lift is situated centrally, and at the time of our visit was being used by operatives on the site, although the major part of the construction work was being carried out several floors below. The feature of this block is that much of the accommodation is on two levels. In some cases bedrooms are beneath the living accommodation, with the balcony at bedroom level; conversely others are designed on the traditional pattern with bedrooms above the living space. Five tower cranes were in use on this contract, three for the transport of materials and two smaller ones for handling the prefabricated concrete wall-slabs.

During the course of the week we spent in Berlin we met many of the builders associated with the Exhibition. In Berlin the title Master Builder can only be gained after at least 11 years in the building industry. The first three years must be spent as an apprentice. This is followed by three years part-time study at Technical College to qualify as an engineer. Then, after practising for five years one is entitled to be described as a Master Builder, and only then is it possible for anyone to employ labour and trade as a builder. On the other hand, it is not necessary to have any specific qualifications to practise as an architect, though qualifications there must be to gain admission to the German Association of Master Builders, Architects and Civil Engineers, membership of which is virtually essential to success. In fact, the position is rather like that in this country before the passing of the Architects Registration Act.

Relations between employers and operatives seem to be extremely good, and no serious trouble has occurred during the last four years. The standard rate of wages varies for each craft. Plasterers and bricklayers, who are in great demand, receive DM 2.80 per hour (DM 1=1s. 8½d.) but a good craftsman can earn as much as DM 4.80 per hour. Except on exhibition work, overtime is unusual. The normal working week is 48 hours, 8½ hours Monday to Friday, 5½ hours on Saturday. Work begins at 7 a.m., with a break of 30 minutes at 8.30 a.m. for breakfast, and the dinner break appears to vary from 30 minutes to one hour. A builder who had a very big contract on the outskirts of Berlin told me that because of the time taken to travel to the site his office staff had elected to forgo their one-hour lunch, but I do not know if this is a common practice.

BOOKS RECEIVED

THE RENT ACT, 1957. By S. W. Magnus, BA. (London: Butterworth and Co. (Publishers), Ltd.) Price 32s. 6d.

AMERICAN CIVIL ENGINEERING PRACTICE. Vol. 3. By R. W. Abbett. (London: Chapman and Hall.) Price £10.

TIMBER IDENTIFICATION. By N. Clifford. (London: Leonard Hill (Books) Ltd.). Price 37s. 6d.

SPEEDING SLUM CLEARANCE

'Local Authorities' Biggest Housing Job'

SPEAKING at the annual conference of the Association of Municipal Corporations at Hastings, on September 18, MR. HENRY BROOKE, Minister of Housing and Local Government, emphasised that slum clearance was the biggest housing job local authorities now had on hand.

'This is the second year of the new drive initiated by Mr. Macmillan when he was in my place to get rid of slums; and progress so far has been very encouraging,' said Mr. Brooke. 'Last year was a fine start, in the demolition or acquisition of houses at a rate that corresponded to the rehousing of more than 100,000 people a year. The current year is going to show still further progress. I see the flow of orders for acquisition and clearance continuing to increase. That promises well for further expansion of the programme.

'But the important thing is that these acquisition and slum clearance orders should be translated into new bricks and mortar, and that rehousing of the people should keep pace with clearance on a growing scale. So far as I can see, if we are really to achieve this, a much larger proportion of local authority building will need to be turned over to slum clearance purposes. In my view a greater concentration of effort on rehousing from the slums is still needed. I hope that authorities which have not already done so will speed up the changeover, and make certain that a bigger and growing share of their new building shall be for the benefit of families whose present homes ought to be pulled down just as quickly as can be.'

Improvements and Conversions

The Minister said that grants for the improvement of older houses were running at the rate of about 35,000 a year. Over 100,000 had been made in the past 3½ years, but the number seemed to be levelling off at about 35,000 a year. Grants were available for both improvement and conversion work, and their administration was entirely in the hands of the housing authorities.

'It is a big responsibility,' said the Minister, 'and it is directly upon the councils. What is disappointing and discouraging to me, and to all who care about housing progress, is that a small minority—128 out of a total of 1,468 housing authorities —have not yet done so.

'I am bound to say also that some authorities which are giving grants seem to be doing so in a rather foolish or halfhearted way. Some authorities, I find, are willing to pay grants for the improvement of owner-occupied houses, but not of houses that are let. If they think that is a logical plan, let me tell them that other authorities have made it their policy to do exactly the reverse. Then again there are some authorities who scale down the full benefits and do not let an applicant receive as much as the 50 per cent. allowed under the scheme.'

The Minister added that councils who were unwilling to use the scheme, or to use it to the full, were denying to some citizens the opportunities and benefits which were available to most citizens and should be to all.

Mr. Brooke also asked more councils to consider pursuing the quest for greater efficiency by using an Organisation and Methods service.

SITE FOR LCC'S NEW TOWN

Talks to be Held with Ministry

AS a first step to the establishment of its own new town, which was recently approved in principle by the Government, the London County Council has instructed its officers to discuss with the Ministry of Housing and Local Government sites which appear to be suitable and to report on the conclusions reached. This was disclosed in a joint report of the Housing, Town Planning and Finance Committees that was presented to the Council at its meeting on Tuesday (September 24).

The report states that in reply to the Council's representations that a Government assurance should be given that capital would be made available additional to that required for its normal expenditure, the Minister says that the raising of capital would have to follow the rules in force at the time, although he has no reason to expect that this would involve the Council in any major difficulty.

The Minister adds, says the report, that an approved project would qualify for the subsidy payable under section 3(3)(e) of the Housing Subsidies Act, 1956, which is £24 a year for 60 years for each dwelling, with related increases for flats of four or more storeys. The scheme would also be eligible for consideration for grants payable under Section 2(2)(d) of the Town Development Act, 1952, which, under present Government practice in respect of schemes under the Act, are not exceeding 50 per cent. of the expenses of providing, extending or improving in the course of development, main water supplies, main sewerage and sewage disposal services.

The size of the new town, the report continues, would need consideration in the light of its location and other factors and no figure of cost can therefore be given, but as an indication of the expenditure which might be involved it is estimated that a town for 60,000 people might cost something of the order of £50m. spread over ten to fifteen years. The Minister's refusal to give the assurance on capital finance which the Council needed could therefore lead to a situation in which a new town would be competing with the Council's other services for the available capital funds.

It would be the intention that the provision of capital finance by the Council for the development of a new town should not lead to any reduction in necessary developments in the other services of the Council. 'We have, therefore, informed the Minister that in the event of the Council's undertaking the development of a new town and major difficulties arising on the provision of capital finance for the project in the course of its progress, the Council will expect the Government to play its part in enabling the necessary funds to be obtained.

'The urgent need for a further new town to ease London's housing and redevelopment problems makes it essential in our view, however, that the Council shall proceed with the project if a scheme can be prepared which the Council can confidently be recommended to undertake on the basis of its own resources, and we have accordingly, as a first step, instructed officers of the Council to discuss with officers of the Ministry of Housing and Local Government sites which prima facie appear to be suitable and to report on the conclusions reached. Thereafter it will be possible to consult with the local authorities of the areas concerned and to report in greater detail on the financial and other implications of the project.'

TOWN PLANNING DECISIONS

Minister Refuses to Allow Shop in Southend-on-Sea Square

THE refusal of Southend Borough Council to permit the use of the ground floor of No. 1, Warrior-square, Southend-on-Sea, partly for office supplies and equipment and partly as a wholesale and retail confectioners' and tobacconists' shop has been upheld by the Minister of Housing and Local Government, following a public inquiry.

The Minister says he appreciates that a number of uses have become established in the square which are not in conformity with the zoning for the area, but these are mainly of an office or professional character.

Warrior-square has a special character, and he agrees with the Council that it would be marred by the introduction of a shop. While the Minister notes that it is not proposed to alter that elevation of the property which faces the square itself, he feels that the appellant's proposal would be quite unwarranted and out of keeping with the surroundings. He has accordingly decided to dismiss the appeal.

Kent Area of 'Great Landscape Value': Housing Appeal Dismissed

PLANNING permission for the erection of 18 to 20 houses on land at Flexford Nurseries, Charing, was recently refused by the West Ashford RDC, acting on behalf of Kent CC, on the grounds that (1) the site is not in an area in which residential development at Charing is intended to take place; (2) the proposal, if permitted, would be detrimental to the amenities of the locality, which is shown in the Kent Development Plan to be within an area of great landscape value; (3) the proposed development would also be likely to cause inconvenience and danger to traffic.

Following a public inquiry, the Minister has dismissed an appeal against the Council's decision, he having come to the conclusion that the grounds on which the Council decided to refuse permission were soundly based.

Mock Window in Bungalow Held by Minister to be 'Quite Unnecessary'

THE following condition was imposed by the Southborough (Kent) UDC, acting on behalf of the Kent CC, in granting Mr.

J. R. C. Hindle planning permission to erect a bungalow at the junction of Broomhill Park-road and Prospect-road, Southborough: 'The window opening of the proposed bedroom facing Broomhill Park-road to be enlarged by a mock panel so as to match in size the living-room window in the same elevation.'

In allowing an appeal against this condition, the Minister of Housing and Local Government states that he is of the opinion that the mock window required by the condition in question is quite unnecessary to ensure that the external appearance of the proposed building is satisfactory.

Permission for Limestone Quarrying at Berry Head, Devon, Refused

PLANNING permission for the quarrying of limestone from the headland at Berry Head, a South Devon beauty spot, has been refused by the Minister of Housing and Local Government following a public inquiry into an application by the Berry Head Lime and Stone Co., who are already carrying out certain quarrying operations in the Berry Head district and proposed to extend their activities to a further area of 15 acres.

The headland provides a magnificent view of the full sweep of Torbay, and objections to the company's proposal were lodged by local and national preservation societies and a number of councils.

In the Minister's view there is insufficient evidence to justify the granting of permission 'for the extension of quarrying operations into the centre of a famous headland.' He considers that adequate supplies of limestone for markets served by the Berry Head quarries can be obtained elsewhere.

INQUIRY BUREAU

Foundations on Clay Subsoil

Q.—Would you please give me your advice on the two following points:

(1) A builder who is about to build me a bungalow on a site with clay sub-soil is proposing to excavate merely about 18 in. (which amounts to removing little more than the top soil) for foundations which he would make 24 in. wide. If I insist on 3 ft. as a minimum for foundations as recommended by the best authorities, is it likely that any snag may be met which would not have appeared if I had let the builder alone to do as he wished? The site is not drained. It has an almost imperceptible slope towards two adjoining boundaries, one of which is a shallow ditch which seldom contains much water and is normally dry in summer. What would be the line of action if, on excavating down to 3 ft. the trenches quickly collected water seeping through the sides?

(2) Is it considered satisfactory practice to use concrete blocks for walls below dpc instead of the appropriate type of brick?

H. G. D.

A.—When constructing buildings on a clay subsoil it is always best to place the foundations at a depth where the clay is not influenced by the atmosphere. When clay dries out it shrinks and cracks. Some clays shrink more than others, the deeper the clay is in the ground the less chance of the atmosphere drying it out during hot summer spells.

The recognised atmospheric depth for building on shrinkable clays is between 3 and 5 feet according to the weight of the structure and the character of the clay. The weight of the building in this case is not great, but 18 inches is too shallow for a standard strip foundation unless it is incorporated in a reinforced concrete raft. This means when the whole site within the walls is covered with a 5 or 6 in. slab of concrete reinforced with steel mesh or similar reinforcement, and cast in one with the concrete wall foundations. If shrinkage should occur at any point of the foundation the rest of the site area helps to carry the load and settlement cracks are not likely to occur. The builder may have this in mind when stating the depth.

I have seen quite recently bungalows built with strip foundations only 2 feet below ground level in a clay soil, but I would not advise it, and do not know why the local building inspector allowed it in this case. You could see the local building authority and ask their opinion.

I can see no snags if you insist on a 3 ft. digging except the extra cost of the work and materials. From what is said about the site, it does not seem to be waterlogged and any water that does accumulate should follow the line of the new drains the trenches of which, although filled in, should act as channels. The local building inspector with his knowledge of the ground should be able to help here.

The builder would handle any seepage water in the trenches by pumping or baling out the water during the construction of the foundations.

Concrete blocks can be used for the walls below damp-proof course. The quality of the concrete blocks used is important as it has to be durable to withstand frost action where it is so exposed, and to sulphate action from the soil in some areas. The type of concrete block depends on the amount of the concentration of sulphate in the ground. Again consult the local authority.

It depends on the district and the availability of supplies as to which material will be more economical.

R. M. E.

Condensation in Bathroom and Kitchen Extension

Q.—Four years ago I had a small kitchen with bathroom adjoining, built on to my small bungalow. The walls are breeze blocks, rough-cast outside, plastered inside; the bathroom half-tiled all round; the kitchen half-tiled in the corner where the electric cooker stands. All water is heated in the bathroom by an electric heater, and there is no other heat in the kitchen except the cooker. I am troubled with a great deal of condensation, which as soon as the weather gets cool, is a great nuisance, not only running down the walls, but hanging in small drops all over the ceiling. Also, the walls are spoilt by small black specks which seem to come through from the plaster and spoil them almost as soon as they are redecorated—in fact, each year I have had to have both rooms redecorated.

I am wondering if the walls can be treated in any way before any kind of distemper is put on, to save these marks coming through and to lessen the condensation.

M. E. F.

A.—First, the building concerned is a new addition and is exposed on all sides to the cold external atmosphere except where it adjoins the house. It will be noticed that the existing wall at this position is unaffected because the dining-room is on the other side and not exposed.

Condensation in a building occurs when heated air, which holds more moisture in suspension than does cold air, comes into contact with a cold surface, when the moisture in the warm air condenses on the cold surface.

It is stated that the walls are built of breeze blocks plastered on the inside and rough-cast outside. The thickness of the walls is not given, but if they are to be efficient they should be of sufficient thickness to give the necessary insulation from the external atmosphere, or built as two skins with a cavity in between, or of blocks of a type which will give a similar effect. It is obvious that the walls are not giving this insulation and cannot be made to do so without incurring a lot of expense, which it is felt is out of the question in this case.

The construction of the roof is not stated. If it is a pitched roof then there is a space formed between the top of the ceiling and the sloping underside of the roof. This could be insulated by opening up the roof and covering the ceiling with a fibre-glass quilting which is quite cheap.

The black spots mentioned may be coming from the breeze blocks of which the walls are constructed. If moisture from driving rain, or through badly constructed eaves, where rain water may run back and seep down the wall behind the gutter, was to find its way into fine shrinkage cracks in the rough-casting, then by capillary attraction it would carry any soluble material in the breeze blocks into and through the inside plaster.

The first thing that should be done is to wash and clean off as much of the existing paint and distemper as possible, from the inside walls and ceilings. The black spots may be observed as specks or smaller spots than those seen on the surface of the paint, where they tend to spread on coming through. The next operation is to treat the outside of the walls with two coats of a colourless waterproofing solution of which there are a number on the market. If there are no black spots on the plaster when washed off, then they are caused through a mould growth due to the condensation. This can be recognised with a magnifying glass when a furring round the edges of the spots can be seen. In this case the outside treatment of the walls may not be necessary, but having washed the walls, an application of an anti-fungicidal solution is necessary. This is followed by a priming paint and then by an anti-condensation paint. The three covering materials referred to should be from the same manufacturer and applied according to the instructions on the tins. Different makes do not mix well.

R. M. E.

ACCIDENT PREVENTION

'Building Industry has Taken Up Challenge'

A TRIBUTE to the response of the building industry to his recent challenge on accident prevention was made by SIR GEORGE BARNETT, HM's Chief Inspector of Factories, when he addressed the council of the Southern Counties Federation of Building Trades Employers on September 13.

'I did seriously consider my last report which was rather critical of the building industry,' he said. 'I put forward a challenge and you have taken up that challenge as no industry has taken it up before. I would like to say a word of thanks to your National president, Mr. Leonard Walden. No president could have put plainer words before an industry. The technical Press also have co-operated by devoting plenty of space to safety.

'There seems to be a deeply-rooted conviction that all building work is inherently dangerous,' Sir George continued, 'that accidents are inevitable, and that their avoidance is a matter depending principally on the skill of the individual workman. Industrial experience shows that this is not so. Prevention methods must demonstrate that accidents are not inevitable, that skilled as well as unskilled are liable to accidents, and must get at the small employer as well as the large.

'The total number of reportable accidents in the building trade has risen steadily over the last five years, from 12,300 to 14,600, and during the same period fatalities have varied between 172 and 207, being 188 for 1956. The building trade, when compared with other industrial trades, is the only one with five figures for reportable accidents and three figures for fatal accidents.'

To bring these accident figures into perspective and appreciate their significance, the speaker pointed out that the time lost through industrial disputes in 1956 was 2,083,000 man days; the time lost through industrial accidents was approximately 20 million man days. In addition, he said that the building trade employed about 15 per cent. of all industrial workers and accounted for 33 per cent. of all fatal accidents.

Falls provided a class of accident which must be studied and which, if reduced, would largely break the back of the accident problem in the building trade. The problem of preventing falls could be approached on two lines: (1) Getting to the workplace safely; (2) staying safely at the working place. 'If these two conditions can be achieved, falls should largely be eliminated. A good slogan for general foremen might be "Can the man get there safely? Is he safe when he gets there?"'

The formation of Accident Prevention Groups which met regularly to discuss safety, said Sir George Barnett, had a proved method of dealing with accident problems. 'These groups are comparatively new in the building trade and until about 12 months ago there was only one which did effective work —that in London, of which I am president. This position was disappointing, but since then it is encouraging to find that an energetic group has grown up in Birmingham and that real efforts are being made to form others. I hear that the inaugural meeting of a group at Reading was held last week (September 5) and that a Committee was elected under the presidency of Mr. Walden, your national president, representing the employers, the operatives, the guild of foremen and the architects. This is believed to be the first time that the architectural profession has been represented on such a committee.'

The speaker added that it has been decided to form a special section within the Factory Inspectorate which will deal solely with building and civil engineering accident problems. This section had already commenced its work and should be of great help to the building industry.

THERMOPLASTIC MATERIALS

Effects of Pressure

WITH reference to a statement on thermoplastic materials in a paper on 'New Building Materials and Maintenance Costs' (published in *The Builder* on July 26), of which he was joint author (with Mr. E. I. Roberts), MR. J. J. ATKINSON, deputy housing manager, Birmingham, makes the following comment on the remarks on this subject by Semtex, Ltd. (See *The Builder*, September 13, page 459):

The question of indentation and the effect of heat on thermoplastic tiling must be considered together. There is a progressive softening of the material with a rise in temperature and, therefore, an increasing tendency to indent or for the surface to be scratched and broken. Although it is true that the tiling may withstand a surface temperature of 80 deg. before there is any appreciable breaking down, the point at which the softening is such as to give concern in a room with normal household furniture and subject to normal use is, from test and experience, between the figures given in the Paper. It is, of course, true that indentation is a defect of all resilient and semi-resilient coverings as well as timber, but it becomes particularly important in thermoplastic tiling because, unlike the majority of the other materials, it is particularly susceptible to changes in temperature. I would add that this question is likely to assume greater importance with the increasing use of embedded electric floor heating.

Timber Defended

MR. PHILLIP O. REECE, Director, the Timber Development Association, comments as follows on the statement of Semtex, Ltd.: Thermoplastic tiles suffer from indentation under heavy pieces of furniture, and it is stated that the same is true of all other resilient and semi-resilient materials and of timber floors. This is inaccurate. The indentation of thermoplastic tiles is due not to resilience (which would imply a fairly high degree of recovery), but to viscosity. It is a phenomenon of gradual flow under prolonged loading and is directly linked with a low softening temperature.

The same cannot be said of timber. There are admittedly varying degrees of hardness in softwood and hardwood floorings of different species. Whilst some are more liable to scratching and marking, others, particularly of the heavier hardwood species, will resist the most severe conditions of wear and impact. Timber floors in general are free from the phenomenon of flow under load, and this surely is the point at issue.

HOUSING LAND AT COVENTRY

Inquiry into Compulsory Purchase Order

COVENTRY City Council's 'lust for land' was attacked at a public inquiry in the city on September 18 by a barrister, Mr. Eric Blain, appearing for the Sir Thomas White's Charity.

The inquiry was to hear objections by the charity's trustees and by Mr. A. G. E. Martin, a garage proprietor, to a compulsory purchase order made by the council on 14 acres of land—nine belonging to the charity and five to Mr. Martin—required at Willenhall for municipal houses.

Mr. Martin also appealed against the council's refusal to give planning permission for a garage and petrol-filling station on about an acre of his land.

MR. BLAIN, in cross-examination of Mr. W. Burns, the Corporation's Principal Planning Assistant, had established that housing was considered to be a proper use of the land, and that application for planning permission had been refused.

MR. BURNS agreed that the issue was one of council policy. He said that no council member was present to justify that policy. MR. BLAIN told the inspector, Mr. D. I. Pryde, that all land owned by the charity had been offered to the Corporation in 1944. The Corporation had subsequently bought a considerable acreage from the trustees, but the nine acres had not been wanted.

The compulsory purchase order came after an offer of £8,500 for ten acres, including the nine concerned in the appeal, for private housing development.

Mr. Blain added that if the Corporation was now seeking to acquire the land at a quarter of its market value, its action was dictated by 'Coventry's notorious boasted lust for land acquisition—the sort of attitude which can only be justified if someone can convince you it is good policy.' The officers presenting the Corporation's case were not to be blamed. Those responsible for it, who should expound the policy and say what good it did anyone, stayed away—'a shocking spectacle.'

Mr. Blain attacked the policy advisory committee of the city council, which, he had been told, had approved that the housing committee should apply for a compulsory purchase order.

'I have never heard of such a body in any other city,' he said. 'It is a name given to a gaggle of acquisitive extremists whose policy can only be akin to that behind the Iron Curtain.'

Mr. Blain pointed out that Coventry was the chief beneficiary under annual distributions by the Sir Thomas White Charity. If the compulsory purchase order was approved he would advise the trustees to consider asking the Courts if the terms of the charity could be varied to eliminate Coventry as a beneficiary.

MR. W. H. CLARK, for the Corporation, said the land was wanted for the Willenhall Wood municipal housing scheme, which covered 70 acres and would have 1,410 dwellings, of which 240 would be on the land covered by the purchase order.

The Minister's decision will be made known.

GEOMETRICAL ASPECTS OF MODULAR CO-ORDINATION*

By J. W. HARDING and L. S. VALLANCE
(of the Building Research Station, DSIR)

Introduction

IT is a well-known fact that a range of dimensions can be produced from combinations of just a few dimensions in much the same way as a grocer can get all the weights he needs by combining a limited number of standard weights. It is not so generally known that problems of this type have been treated in a branch of mathematics known as the additive theory of numbers. The object of this paper is to indicate possible applications of this theory to the type of problem with which the architect is confronted in the choice of modular dimensions.

We shall consider only the simplest class of such problems, namely the properties of a set of dimensions obtained by combining just two basic dimensions. It would, however, be over-optimistic to suppose that the varied requirements of modular co-orination could be based on just two fundamental dimensions. The scope of the treatment will therefore be extended by considering several pairs of dimensions, systematically related so that the set of dimensions derived from a fairly large basic pair may be suitable to deal with large-scale features of design, a set of dimensions derived from a smaller, but related, pair may be suitable for smaller-scale features, and so on.

The authors, as mathematicians, are not competent to deal with architectural detail. Nevertheless it is hoped that a sufficient indication of the nature of the method has been given to enable the architect to examine other possibilities and find something to help him in solving practical problems.

A Number Theorem

There is a theorem in the additive theory of numbers that provides some useful general information about the properties of a set of numbers derived by combining a given pair of numbers in all possible ways. Results about the combination of numbers can easily be converted into results about the combination of dimensions. The theorem may be stated in simple terms as follows:

If a and b are any positive whole numbers *without a common factor* and if we write down the number $(a-1)\ (b-1)$ and call the result N, that is

$$(a-1)\ (b-1)=N$$

then it can be proved that the whole number N and *any* whole number greater than N can be expressed as a combination of a and b (i.e., some multiple of a plus some multiple of b). Below this whole number N, which may be called the critical number, there are just $N/2-1$ whole numbers which can be expressed as combinations of a and b. The complete set of numbers may, of course, be found by writing down all combinations of a and b taken first one at a time, then two at a time, then three at a time, and so on.

This theorem relating to pure numbers may be interpreted in terms of dimensions by assuming that the pure numbers express so many units of a basic length t, say 1 in., 2 in., 3 in., 4 in., 4½ in., 10 cm., 12 cm., etc., as the case may be. The theorem then tells us that a dimension Nt and any dimension greater than this *on a grid of mesh* t can be expressed as a combination of the two basic dimensions, at and bt, where N is obtained from the chosen values of a and b by means of the equation given above. Below the dimension Nt, which may be called the critical dimension, just $N/2-1$ dimensions can be expressed as combinations of at and bt. The set of dimensions may be obtained either by finding all combinations of the chosen numbers and then multiplying each number by t, the grid mesh, or more directly by finding all combinations of the chosen dimensions, at and bt.

Examples

(i) If $a = 3$, $b = 4$ and $t = 4\frac{1}{2}$ in., the critical number N is $(3-1)\ (4-1) = 6$, the critical dimension Nt is $6 \times 4\frac{1}{2}$ in. = 27 in., and the theorem tells us that 27 in. and every dimension greater than this on a 4½ in. grid can be expressed as combinations of the two basic dimensions $at = 3 \times 4\frac{1}{2}$ in. = $13\frac{1}{2}$ in. and $bt = 4 \times 4\frac{1}{2}$ in. = 18 in. Below 27 in. just $N/2-1 = 2$ dimensions can be expressed as combinations of $13\frac{1}{2}$ in. and 18 in. The dimensions below 27 in. are, of course,

$13\frac{1}{2}$ in. $= 1 \times 13\frac{1}{2}$ in. $+ 0 \times 18$ in.
18 in. $= 0 \times 13\frac{1}{2}$ in. $+ 1 \times 18$ in.

This is a rather trivial example, but it is encouraging in that it shows that combinations of two relatively large units, $13\frac{1}{2}$ in. and 18 in., reproduce almost as many dimensions on the 4½ in. grid as do half-bricks. The only missing dimensions are 4½ in., 9 in. and $22\frac{1}{2}$ in.

If, for definiteness, the dimensions of $13\frac{1}{2}$ in. and 18 in. are thought of as widths of panels or lengths of blocks, these results suggest that it may be possible to introduce larger basic dimensions, thus increasing the coverage for a given number of units laid, and still obtain a sufficient number of dimensions on the 4½ in. grid to enable problems of fitting, in particular the so-called thickness problem, to be solved.

The question then arises as to how to choose a larger basic pair. It would clearly be an advantage to choose the larger pair in such a way that the pair is simply and systematically related to the initial choice. Dimensions derived from the initial pair could then be used in situations where the larger pair provided an inadequate supply of dimensions. One of the simplest ways of doing this in the present example would be to retain the larger dimension (18 in.) as one member of the new pair and take the sum of the original pair, $13\frac{1}{2}$ in. + 18 in. = $31\frac{1}{2}$ in., as the second member. The properties of the set of dimensions based on the larger pair, 18 in. and $31\frac{1}{2}$ in., will be developed in the next example.

(ii) If $a = 4$, $b = 3 + 4 = 7$ and $t = 4\frac{1}{2}$ in., the critical number N is $(4-1)\ (7-1) = 18$, the critical dimension is $Nt = 18 \times 4\frac{1}{2}$ in. = 6 ft. 9 in., and the theorem tells us that 6 ft. 9 in., and every dimension greater than this on the 4½-in. grid can be expressed as a combination of the two basic dimensions $at = 4 \times 4\frac{1}{2}$ in. = 18 in., and $bt = 7 \times 4\frac{1}{2}$ in. = $31\frac{1}{2}$ in. Below the critical dimension $Nt = 6$ ft. 9 in., just $N/2-1 = 8$ dimensions can be expressed as combinations of 18 in. and $31\frac{1}{2}$ in. The complete set of dimensions based on 18 in. and $31\frac{1}{2}$ in. can be found by combining 18 in. and $31\frac{1}{2}$ in. systematically in all possible ways :

in.	in.	ft.	in.	
$1\times18+0\times31\frac{1}{2}=(1,0)=$		1	6	Group 1 (one at a time)
$0\times18+1\times31\frac{1}{2}=(0,1)=$		2	$7\frac{1}{2}$	
$2\times18+0\times31\frac{1}{2}=(2,0)=$		3	0	Group 2 (two at a time)
$1\times18+1\times31\frac{1}{2}=(1,1)=$		4	$1\frac{1}{2}$	
$0\times18+2\times31\frac{1}{2}=(0,2)=$		5	3	
$3\times18+0\times31\frac{1}{2}=(3,0)=$		4	6	Group 3 (three at a time)
$2\times18+1\times31\frac{1}{2}=(2,1)=$		5	$7\frac{1}{2}$	
$1\times18+2\times31\frac{1}{2}=(1,2)=$		6	9	
$0\times18+3\times31\frac{1}{2}=(0,3)=$		7	$10\frac{1}{2}$	

and so on for Groups 4, 5, 6, etc.

Before we proceed further, a few points should be noted about the set of dimensions derived in this way. First, it has been found convenient to introduce, in the second column, a compact form of notation for the combinations indicated in the first column. The meaning of the notation will be clear from a comparison of the first and second columns. In this paper we shall be discussing several different pairs, and it would be inconvenient to introduce a new form of notation in discussing each different pair. For this reason the symbol (p, q) will be taken to mean p times the smaller of the two basic units plus q times the larger of the two units, irrespective of the particular pair under discussion. This should cause no confusion since the pair of basic units involved in any example will appear at the head of the associated table, and will always be assigned the symbols (1, 0) for the smaller and (0, 1) for the larger of the pair. It is only when two different pairs are under discussion in the same context that a distinction will have to be made in the symbols employed. The usefulness of the symbols will appear more clearly when we come to examine the breakdown of a dimension for the purpose of solving problems of fitting.

Second, it should be noted that each group of the table can be written down quickly by observing the fact that a group begins with a dimension which is the number of the group multiplied by the smaller of the two basic dimensions, proceeds in steps which are given by the difference of the two basic dimensions, and ends with a dimension which is the number of the group multiplied by the larger of the basic pair. For example, Group 3 shown above begins with 3×18 in. = 4 ft. 6 in., proceeds in steps of $31\frac{1}{2}$ in. $-$ 18 in. = 1 ft. $1\frac{1}{2}$ in., and ends with $3 \times 31\frac{1}{2}$ in. = 7 ft. $10\frac{1}{2}$ in.

The fact that the difference of the pair, $13\frac{1}{2}$ in. in the case of 18 in., and $31\frac{1}{2}$ in., is

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built into the set of dimensions derived, is a matter of some importance in choosing pairs of dimensions. It means that while a derived dimension will appear to be based on only two dimensions, say, 18 in. and 31½ in., many dimensions in the set will differ by 13½ in. and multiples of 13½ in., so that there is the possibility of subtracting 13½ in. or a multiple thereof from a dimension in the set and of obtaining another dimension which is also in the set, for example, from the table above:

7 ft. 10½ in. − 13½ in. = (0,3) − 13½ in. = (1, 2)

7 ft. 10½ in. − 2 × 13½ in. = (0, 3) − 27 in. = (2, 1)

and so on. While 27 in. is not a modular dimension in the set based on the larger pair, 18 in. and 31½ in., it is a modular dimension in the set based on the smaller pair, 13½ in. and 18 in.

Finally, it should be noted that it often happens that a dimension in one group is smaller than one in a preceding group, for example, 4 ft. 6 in. in Group 3 is smaller than 5 ft. 3 in. in Group 2. For this reason the dimensions are first calculated as indicated above, and then rewritten in order of increasing magnitude in order to reveal more clearly the structure of the set. Table 1 has been constructed in this way, and the modular dimensions are taken as far as 24 ft.; but the table may, of course, be extended as far as is deemed desirable to cover a particular range of problems. The critical dimension, 6 ft. 9 in., is underlined in the Table. It will be noted that there are just eight dimensions below 6 ft. 9 in., as predicted by the number theorem. The dimensions in this Table may be regarded as modular dimensions based on the pair of modules, 18 in. and 31½ in. These modular dimensions possess the property of additivity, that is, the sum of two or more dimensions in the set is also in the set. The additivity property follows from the fact that the set of dimensions was derived by including in the set *all* combinations of the chosen pair of modules.

TABLE 1

Dimensions based on the pair 18 in. and 31½ in. (or the pair 4 and 7) on a 4½-in. grid

Symbol	*Dimension* ft. in.	*Symbol*	*Dimension* ft. in.	*Symbol*	*Dimension* ft. in.
(1, 0)	1 6	(2, 3)	10 10½	(5, 4), (12, 0)	18 0
(0, 1)	2 7½	(4, 2)	11 3	(0, 7), (7, 3)	18 4½
(2, 0)	3 0	(6, 1)	11 7½	(2, 6), (9, 2)	18 9
(1, 1)	4 1½	(1, 4), (8, 0)	12 0	(11, 1), (4, 5)	19 1½
(3, 0)	4 6	(3, 3)	12 4½	(13, 0), (6, 4)	19 6
(0, 2)	5 3	(5, 2)	12 9	(1, 7), (8, 3)	19 10½
(2, 1)	5 7½	(0, 5), (7, 1)	13 1½	(10, 2), (3, 6)	20 3
(4, 0)	6 0	(2, 4), (9, 0)	13 6	(12, 1), (5, 5)	20 7½
(1, 2)	6 9	(4, 3)	13 10½	(14, 0), (0, 8), (7, 4)	21 0
(3, 1)	7 1½	(6, 2)	14 3	(2, 7), (9, 3)	21 4½
(5, 0)	7 6	(1, 5), (8, 1)	14 7½	(4, 6), (11, 2)	21 9
(0, 3)	7 10½	(10, 0), (3, 4)	15 0	(13, 1), (6, 5)	22 1½
(2, 2)	8 3	(5, 3)	15 4½	(15, 0), (8, 4), (1, 8)	22 6
(4, 1)	8 7½	(0, 6), (7, 2)	15 9	(10, 3), (3, 7)	22 10½
(6, 0)	9 0	(2, 5), (9, 1)	16 1½	(5, 6), (12, 2)	23 3
(1, 3)	9 4½	(4, 4), (11, 0)	16 6	(14, 1), (7, 5), (0, 9)	23 7½
(3, 2)	9 9	(6, 3)	16 10½	(16, 0), (9, 4), (2, 8)	24 0
(5, 1)	10 1½	(1, 6), (8, 2)	17 3		
(0, 4), (7, 0)	10 6	(10, 1), (3, 5)	17 7½	and so on.	

Let us suppose that it is required to make provision for two gaps, each 4½ in. wide, for the insertion of transverse partitions in a 24 ft. length of walling. We note from Table 1 that 24 ft. is a modular dimension which can be written as (2, 8). The symbol has the advantage that it shows at a glance that the interval of 24 ft. can be built up from 2 units of 18 in. and 8 units of 31½ in. The residual interval of 23 ft. 3 in. left after 9 in. has been removed for the gaps is also a modular dimension which can be written as (5, 6), which again shows how the interval is built up. We can write

24 ft. = (2, 8) = 2 × 4½ in. + (5, 6).

Now (5, 6) can be broken down into three parts in a variety of ways. For example, we may take

(5, 6) = (2, 1) + (2, 2) + (1, 3).

With this breakdown of (5, 6) the 24 ft. interval can be broken up as follows: 24 = (2, 8) = (2, 1) + 4½ in. partition + (2, 2) + 4½ in. partition + (1, 3), which gives room lengths of (2, 1) = 5 ft. 7½ in., (2, 2) = 8 ft. 3 in. and (1, 3) = 9 ft. 4½ in., all of which dimensions are, of course, modular dimensions in an 18 in., 31½ in. system. The room lengths can be spanned by 2 units of 18 in., plus 1 unit of 31½ in., 2 units of 18 in., plus 2 units of 31½ in., and 1 unit of 18 in., plus 3 units of 31½ in. respectively.

It will further be noted that wherever (2, 0) = 3 ft. occurs in a dimension a door of 3 ft. in overall width may be inserted instead of two small panels or blocks, and wherever (0, 1) occurs in dimension a door of 31½ in. in overall width may be inserted instead of one large panel or block. The relation given above may therefore be rewritten in some such form as the following:

24 = (2, 8) = (1, 0) + (0, 1) door + (1, 0) + 4½ in. partition + (0, 1) + (2, 0) door + (0, 1) + 4½ in. partition + (1, 0) + (0, 1) door + (0, 2).

In many cases it is possible to introduce non-modular door sizes, that is, door sizes that are not included in Table 1. For example, it can be seen by reference to Table 1 that in a modular interval of 8 ft. 3 in. = (2, 2) there is an immediate choice of a door of overall width (2, 0) = 36 in. or (0, 1) = 31½ in. Suppose, however, that a smaller non-modular door width of 27 in. is required. We can write: 8 ft. 3 in. = 8 ft. 7½ in. − 4½ in. = (4, 1) − 4½ in. which can be interpreted as

8 ft. 3 in. =
(4, 0) walling + (0, 1) door − 4½ in.,
= (4, 0) walling + 27 in. door.

It should be noted, however, that when a non-modular door size is used in conjunction with panelling there will be a break in the pattern of the panelling at the level of the top of the door, because above this level the interval of 8 ft. 3 in. is spanned by:

8 ft. 3 in. = (2, 2) panelling,

while below this level 8 ft. 3 in. is spanned by:

8 ft. 3 in. = (4, 0) panelling + 27 in. door,

with the result that it is not possible to run all panels straight up from floor to ceiling unless a panel 27 in. wide is provided to fit above the door.

In this connection it may be remarked, however, that in the set of modular dimensions derived from the smaller pair of modules, 13½ in. and 18 in., a range of three *modular* door sizes is immediately available from the combinations of 13½ in. and 18 in. taken two at a time:

27 in. = 2 × 13½ in. + 0 × 18 in.,
31½ in. = 1 × 13½ in. + 1 × 18 in.,
36 in. = 0 × 13½ in. + 2 × 18 in.

The disadvantage of a solution in terms of the smaller pair of modules is that more units have to be laid to span the same interval and, of course, this means increasing the number of positions that have to be specified. In congested regions, however, a solution in terms of smaller modules may be necessary and we proceed to discuss this situation with the aid of a simple example.

Let us suppose that it is required to insert a transverse partition in an interval of 6 ft. 9 in. Although 6 ft. 9 in. is a modular dimension, 6 ft. 4½ in. is not a modular dimension in the set based on 18 in. and 31½ in. We would normally hope to compromise and plan in such a way that either 7 ft. 1½ in. or 6 ft. 0 in. could be accepted instead of 6 ft. 9 in., in which case the problem could be solved immediately in terms of 18 in. and 31½ in. If, for some reason, the interval must remain at 6 ft. 9 in., we drop to the set based on the smaller modules, 13½ in. and 18 in. In this set both 6 ft. 4½ in. and 6 ft. 9 in. are modular dimensions. We can write

6 ft. 9 in. = (1, 2)
= 1 × 18 in. + 2 × (13½ in. + 18 in.)
= 2 × 13½ in. + 3 × 18 in.

If, in the last result, we replace an 18 in. unit by a 13½ in. unit we find

6 ft. 4½ in. = 3 × 13½ in. + 2 × 18 in.

and we can write

6 ft. 9 in. = 4½ in. gap + 3 × 13½ in. + 2 × 18 in.

and the given problem can be solved in a variety of ways such as the following:

6 ft. 9 in. = 3 × 13½ in. + 4½ in. partition + 2 × 18 in.

Some Alternative Approaches

In the following examples a number of alternative approaches to a solution of the fitting problem will now be discussed. In order to establish some basis of comparison between alternative systems the basic modules will be chosen in such a way as to

provide approximately the same amount of coverage for a given number of units laid, irrespective of the particular choice of grid size.

(iii) If $a = 3$, $b = 5$ and $t = 4$ in., the critical number N is $(3-1)(5-1) = 8$, the critical dimension $Nt = 8 \times 4$ in. $= 32$ in., and the number theorem tells us that 32 in. and every dimension greater than this on a 4-in. grid can be expressed as a combination of the basic modules, $at = 3 \times 4$ in. $=$ 12 in. and $bt = 5 \times 4$ in. $= 20$ in. Below 32 in. just $N/2-1 = 3$ dimensions can be expressed as combinations of 12 in. and 20 in.

Since 12 in. + 20 in. = 32 in. these units may be expected to give about the same amount of coverage as can be obtained with $13\frac{1}{2}$ in. and 18 in., where $13\frac{1}{2}$ in. + 18 in. $= 31\frac{1}{2}$ in.

As before, the set of dimensions based on 12 in. and 20 in. will be held in reserve for the solution of problems in congested regions, and we shall proceed to the more interesting case and derive the set of modular dimensions based on the larger pair of modules which are obtained by retaining 20 in. and by choosing 12 in. + 20 in. = 32 in. for the second member.

(iv) If $a=5$, $b=3+5=8$ and $t=4$ in., the critical number N is $(5-1)(8-1) = 28$, the critical dimension $Nt = 28 \times 4$ in. $=$ 9 ft. 4 in., every dimension on the 4 in. grid from 9 ft. 4 in. upwards can be expressed as combinations of the modules, $at = 5 \times 4$ in. $= 20$ in. and $bt = 8 \times 4$in. $= 32$ in. and there are just $N/2-1 = 13$ dimensions below 9 ft. 4 in. which can be expressed as combinations of 20 in. and 32 in.

The modular dimensions are derived in the same way as has been described in detail in connection with Table 1 and are presented below in Table 2.

TABLE 2

Dimensions based on the pair 20 in. and 32 in. (or the pair 5 and 8) on a 4-in. grid

Symbol	*Dimension* ft.	in.	*Symbol*	*Dimension* ft.	in.
(1, 0)	1	8	(1, 5), (9, 0)	15	0
(0, 1)	2	8	(6, 2)	15	4
(2, 0)	3	4	(3, 4)	15	8
(1, 1)	4	4	(0, 6), (8, 1)	16	0
(3, 0)	5	0	(5, 3)	16	4
(0, 2)	5	4	(2, 5), (10, 0)	16	8
(2, 1)	6	0	(7, 2)	17	0
(4, 0)	6	8	(4, 4)	17	4
(1, 2)	7	0	(1, 6), (9, 1)	17	8
(3, 1)	7	8	(6, 3)	18	0
(0, 3)	8	0	(3, 5), (11, 0)	18	4
(5, 0)	8	4	(0, 7), (8, 2)	18	8
(2, 2)	8	8	(5, 4)	19	0
(4, 1)	9	4	(2, 6), (10, 1)	19	4
(1, 3)	9	8	(7, 3)	19	8
(6, 0)	10	0	(4, 5), (12, 0)	20	0
(3, 2)	10	4	(1, 7), (9, 2)	20	4
(0, 4)	10	8	(6, 4)	20	8
(5, 1)	11	0	(3, 6), (11, 1)	21	0
(2, 3)	11	4	(0, 8), (8, 3)	21	4
(7, 0)	11	8	(5, 5), (13, 0)	21	8
(4, 2)	12	0	(2, 7), (10, 2)	22	0
(1, 4)	12	4	(7, 4)	22	4
(6, 1)	12	8	(4, 6), (12, 1)	22	8
(3, 3)	13	0	(1, 8), (9, 3)	23	0
(0, 5), (8, 0)	13	4	(6, 5), (14, 0)	23	4
(5, 2)	13	8	(3, 7), (11, 2)	23	8
(2, 4)	14	0	(8, 4), (0, 9)	24	0
(7, 1)	14	4	and so on.		
(4, 3)	14	8			

The solution of problems of fitting in terms of this set of modular dimensions (Table 2) proceeds along the lines already indicated in connection with Table 1. It will be noted that the modular door sizes, $31\frac{1}{2}$ in. and 36 in., of Table 1 are now replaced by (0, 1) = 32 in. and (2, 0) = 40 in. Non-modular sizes may be introduced as described in Example (ii). The set based on the smaller pair of modules, 12 in, and 20 in., is available in case of difficulties below the critical dimension, 9 ft. 4 in.

(v) If $a = 7$, $b = 9$ and $t = 2$ in., the critical number N is $(7-1)(9-1) = 48$, the critical dimension $Nt = 48 \times 2$ in. $=$ 8 ft. 0 in. Every dimension from 8 ft. upwards on a 2-in. grid can be expressed as a combination of the modules, $at = 7 \times 2$ in. $= 14$ in. and $bt = 9 \times 2$ in. $=$ 18 in. Below 8 ft. just $N/2-1 = 23$ dimensions can be expressed as combinations of 14 in. and 18 in.

Once again we keep this set in reserve and proceed to examine the properties of the set of modular dimensions based on the larger pair, 18 in. and 14 in.+18 in. $=32$ in.

(vi) If $a = 9$, $b = 7 + 9 = 16$ and $t =$ 2 in., the critical number N is $(9-1)(16-1) = 120$, the critical dimension $Nt =$ 120×2 in. $= 20$ ft. and every dimension from 20 ft. upwards on a 2-in. grid can be expressed as a combination of the modules, $at = 9 \times 2$ in. $= 18$ in. and $bt = 16 \times 2$ in. $= 32$ in. Below 20 ft. there are $N/2-1 =$ 59 dimensions which can be expressed as a combination of 18 in. and 32 in.

This set of modular dimensions may be derived by the usual procedure and is presented below in Table 3.

TABLE 3

Dimensions based on 18 in. and 32 in. (or the pair 9 and 16) on a 2-in. grid

Symbol	*Dimension* ft.	in.	*Symbol*	*Dimension* ft.	in.
(1,0)	1	6	(4, 4)	16	8
(0, 1)	2	8	(6, 3)	17	0
(2, 0)	3	0	(8, 2)	17	4
(1, 1)	4	2	(1, 6)	17	6
(3, 0)	4	6	(10, 1)	17	8
(0, 2)	5	4	(3, 5)	17	10
(2, 1)	5	8	(12, 0)	18	0
(4, 0)	6	0	(5, 4)	18	2
(1, 2)	6	10	(7, 3)	18	6
(3, 1)	7	2	(0, 7)	18	8
(5, 0)	7	6	(9, 2)	18	10
(0, 3)	8	0	(2, 6)	19	0
(2, 2)	8	4	(11, 1)	19	2
(4, 1)	8	8	(4, 5)	19	4
(6, 0)	9	0	(13,0)	19	6
(1, 3)	9	6	(6, 4)	19	8
(3, 2)	9	10	(8, 3)	20	0
(5, 1)	10	2	(1, 7)	20	2
(7, 0)	10	6	(10, 2)	20	4
(0, 4)	10	8	(3, 6)	20	6
(2, 3)	11	0	(12, 1)	20	8
(4, 2)	11	4	(5, 5)	20	10
(6, 1)	11	8	(14, 0)	21	0
(8, 0)	12	0	(7, 4)	21	2
(1, 4)	12	2	(0, 8)	21	4
(3, 3)	12	6	(9, 3)	21	6
(5, 2)	12	10	(2, 7)	21	8
(7, 1)	13	2	(11, 2)	21	10
(0, 5)	13	4	(4, 6)	22	0
(9, 0)	13	6	(13, 1)	22	2
(2, 4)	13	8	(6, 5)	22	4
(4, 3)	14	0	(15, 0)	22	6
(6, 2)	14	4	(8, 4)	22	8
(8, 1)	14	8	(1, 8)	22	10
(1, 5)	14	10	(10, 3)	23	0
(10, 0)	15	0	(3, 7)	23	2
(3, 4)	15	2	(12, 2)	23	4
(5, 3)	15	6	(5, 6)	23	6
(7, 2)	15	10	(14, 1)	23	8
(0, 6)	16	0	(7, 5)	23	10
(9, 1)	16	2	(0, 9), (16, 0)	24	0
(2, 5)	16	4			
(11, 0)	16	6	and so on.		

This system is of interest for several reasons. In the first place, while it gives approximately the same amount of coverage for a given number of units laid as do the two systems already discussed (Tables 1 and 2), there is the possibility of fitting on a 2-in. grid, in particular the possibility of introducing partitions of thicknesses which are multiples of 2 in. instead of multiples of $4\frac{1}{2}$ in. or 4 in.

As before we can insert two or more partitions in a given interval, say two 4-in. partitions in an interval of 24 ft.:

24 ft. = (0, 9) = 2 × 4 in. + (12,2)

and this relation may be, rearranged in some such form as the following:

24 ft. = (0, 9) = (2, 1) + 4-in. partition + (4, 1) + 4-in. partition + (6, 0)

Modular doors may be introduced by means of the relations, (2, 0) = 36-in. door and (0, 1) = 32-in. door.

In addition to introducing 2 in., 4 in., 6 in., partitions we can also introduce a *pair* of 3 in. partitions:

24 ft. = (0, 9) = 2 × 3 in. + (5, 6)

which can be re-arranged in some such form as:

24 = (0, 9) = (2, 1) + 3 in. partition + (0, 3) + 3 in. partition + (3, 2).

Possible Further Developments

It has been seen that an increase in the size of the pair of modules employed raises the value of the critical dimension and restricts the number of modular dimensions available in the range from zero to the critical dimension. It is of great interest to continue the process already employed and to examine how far the size of the pair of modules may be increased without reducing the supply of dimensions in the range below the critical dimensions to an extent which makes it too difficult to solve fitting problems, in particular the thickness problem.

Considerations of space, however, prevent us from reproducing tables of dimensions based on still larger pairs of modules, say the pair $31\frac{1}{2}$ in., $49\frac{1}{2}$ in. on a $4\frac{1}{2}$ in. grid, the pair 32 in., 52 in. on a 4 in. grid and the pair 32 in., 50 in. on a 2 in. grid, all of which pairs are closely related to those which we have considered in Tables 1, 2 and 3 respectively. The only properties of these larger modules to which reference will be made in this paper concern the problem of metric conversion which will be treated in the next section.

Metric Conversion

The process by which successively larger pairs of modules are introduced will be seen to be equivalent to choosing successive pairs from what is known as a Fibonacci series, formed according to the rule that each term of the series beyond the initial pair is the sum of the two preceding terms. The particular Fibonacci series employed will in general depend upon the grid size with which it is to be associated.

In the case of a $4\frac{1}{2}$ in. grid we selected pairs from the Fibonacci series of dimensions:

$4\frac{1}{2}$ in. $13\frac{1}{2}$ in. 18 in. $31\frac{1}{2}$ in. $49\frac{1}{2}$ in. . . . (1)

We now note that $31\frac{1}{2}$ in. differs from 80 cm. by 0.01 per cent and that $49\frac{1}{2}$ in. differs from 125 cm. by 0.58 per cent. The

approximate equivalence of these pairs enables us to set up a corresponding Fibonacci series for metric dimensions by taking 80 cm. and 125 cm. as two successive terms and continuing the series backwards and forwards according to the rule for the formation of a Fibonacci series. We obtain

10 cm. 35 cm. 45 cm. 80 cm. 125 cm . . (2)

If M denotes the metric equivalent of a dimension denoted by B in the British system the percentage differences, $100\ (M-B)/M$, between corresponding terms in the series (1) and (2), in order, are given by −14.3 per cent, + 2.0 per cent, − 1.6 per cent, − 0.01 per cent, − 0.58 per cent, . . . The equivalence established between the leading term of each series namely between $4\frac{1}{2}$ in. and 10 cm., is very poor (− 14.3 per cent); but insofar as it is possible to choose modular dimensions based on higher pairs of each series the difference between corresponding dimensions in the metric and British systems is less than that provided by the 4 in./10 cm. equivalence relationship which involves a constant difference of − 1.6 per cent at all points of the scale.

For example, if 45 cm. and 80 cm. are chosen as a pair of modules, a set of modular dimensions can be derived, as with 18 in. and $31\frac{1}{2}$ in., by finding all combinations of 45 cm. and 80 cm. Corresponding to a modular dimension in the British system given by

$$p \times 18 \text{ in.} + q \times 31\tfrac{1}{2} \text{ in.}$$

where p and q are positive whole numbers including zero, there will be a modular dimension in the metric system given by

$$p \times 45 \text{ cm.} + q \times 80 \text{ cm.}$$

and the difference between the modular dimension in the British system and that in the metric system will lie between − 0.01 per cent and − 1.6 per cent according to the values of p and q.

Insofar as it is possible to select modular dimensions based on the pair $31\frac{1}{2}$ in., $49\frac{1}{2}$ in. in the British system and on the pair 80 cm., 125 cm. in the metric system the difference in corresponding dimensions will be reduced so as to lie between − 0.01 per cent and − 0.58 per cent according to the values of p and q.

If the common factors are removed from (1) and (2) it will be seen that (1) can be replaced by the Fibonacci series of pure numbers:

1 3 4 7 11 . . . . . , (1a)

associated with a $4\frac{1}{2}$ in. grid, and (2) can be replaced by the series

2 7 9 16 25 . . . . . , (2a)

associated with a 5 cm. grid.

In the case of a 4 in. grid, pairs of modules have been selected from the series:

4 in. 8 in. 12 in. 20 in. 32 in. 52 in. . . , (3)

and when the common factor is removed (3) can be replaced by the Fibonacci series :

1 2 3 5 8 13 . . . . . , (3a)

associated with a 4 in. grid. The series (3a) is the particular Fibonacci series used by Le Corbusier in his development of the Modular.

Similarly in the case of a 2 in. grid, pairs of modules have been selected from the series:

4 in., 14 in., 18 in., 32 in., 50 in. . . . , (4)

which again yields the series (2a):

2 7 9 16 25 . . . . . , (4a)=(2a)

associated this time with a 2 in. grid instead of a 5 cm. grid.

Series of metric dimensions corresponding to (3) and (4) may be obtained by applying the approximate 4 in./10 cm. equivalence relationship. Corresponding to (3) we have the series:

10 cm. 20 cm. 30 cm. 50 cm. 80 cm. 130 cm. . . . . , (5)

and corresponding to (4) we again have

10 cm. 35 cm. 45 cm. 80 cm. 125 cm. . . (2)

Nomenclature and the Number-Pair Method

It will be noticed that in the treatment of systems in which the smallest building unit employed is larger than the grid size, we have departed from the usual practice of identifying the module with the grid size. There is, in fact, no real conflict here with the normal nomenclature as will be seen if the process which we have employed is examined with the Fibonacci series (1) as an illustration.

With the choice of the pair of modules $31\frac{1}{2}$ in., $49\frac{1}{2}$ in., the critical dimension lies at 22 ft. 6 in., as can be determined from the number theorem, and there is a restriction in the number of modular sizes in the range from zero to 22 ft. 6 in. With the pair 18 in., $31\frac{1}{2}$ in., there is a restriction in the number of modular sizes in the range from zero to the critical dimension which in this case lies at 6 ft. 9 in. When the pair $13\frac{1}{2}$ in., 18 in., is chosen the critical dimension lies at 27 in., and only three dimensions are now missing from the complete $4\frac{1}{2}$ in. Bemis grid. Finally we reach the pair $4\frac{1}{2}$ in., $13\frac{1}{2}$ in. The critical dimension in this case is zero and fitting with the pair $4\frac{1}{2}$ in., $13\frac{1}{2}$ in., is geometrically equivalent to fitting with a single $4\frac{1}{2}$ in. unit or module which is identical with the grid size. When a building unit of $4\frac{1}{2}$ in. is included, all dimensions on the $4\frac{1}{2}$ in. grid are available as modular sizes because the $4\frac{1}{2}$ in. unit can be used to fill in the gaps between a series of components. In this limiting case the choice of component dimensions is clearly not critical.

Each of the systems which we have described is defined by two modules which serve to define the appropriate Fibonacci series. Alternatively we can specify two numbers and a grid size. This type of system may therefore be described as a bimodular system or as a number-pair system. When the latter description is used, however, the specification of a grid size is always implied.

It follows that the operation of the system of metric conversion described here requires international agreement, not only upon a grid size, but also upon a pair of numbers which need not necessarily be the same in the metric system as in the British system.

The authors would like to thank many of their colleagues who have contributed to the clarification of the ideas presented in this paper.

The work described in this paper has been carried out as part of the research programme of the Building Research Board of the Department of Scientific and Industrial Research and the paper is published by permission of the Director of Building Research.

Midlands Developments

'SINGLE-PERSON' FLATS AT BIRMINGHAM

DURING the next three years Birmingham Corporation is to build 200 'bachelor' flats on five sites spread over the city. The bachelor flats will be at Woodnorton; on Bournville Village Trust land at Shenley Fields; at Tower Hill, Perry Barr; Bordesley Green East; and at King's Norton.

The official description of the flats is 'single-person dwellings.' Mr. A. G. Sheppard Fidler, FRIBA, the City Architect, has designed a standard form of 'bed-sitting-room,' with an adjoining kitchen and bathroom. Although standard in design, the flats, each of which will have its own balcony, can be modified in minor details to suit individual sites.

MR. SHEPPARD FIDLER said: 'The house building committee has felt for some time that there is a need for single-person flats, and we now have several schemes in hand. The flats will be in three-storey blocks, and this building scheme will be supplementary to a scheme for converting existing houses. The kind of tenant we have in mind is the professional or retired person who prefers to live alone rather than in "digs," such as retired nurses and hospital matrons. Each flat will be entirely self-contained, and there will be nothing communal at all. There will be a large bed-sitting-room, a bathroom, kitchen, and a private balcony to each flat.'

WOLVERHAMPTON OVERSPILL

WOLVERHAMPTON housing committee, in a report presented to the Town Council on September 23, approved the suggestion made by Staffordshire County Council that 4,496 council houses should be built as implementation of the overspill scheme—300 in Tettenhall, 400 each in Sedgley and Cannock rural districts, 700 in Willenhall, 500 in Seisdon and 2,196 in Wednesfield.

It was envisaged, the committee states in the report, that Seisdon would complete its programme in 1960, Cannock and Sedgley in 1962, Wednesfield and Willenhall in 1963 and Tettenhall in 1966. These houses would bring the total programme to 5,481—519 fewer than the number of council houses estimated to be needed.

Expressing concern that Seisdon should cease to contribute after 1960, the committee suggests that deficiencies in the programme should be made up in that area.

The committee had resisted the county council's claim for a financial contribution to future overspill building on the same lines as that agreed between the county and Birmingham, and the county council had decided not to press the corporation further.

Thermal Insulation Conference

In view of the new factory insulation Act, the organisers of the Factory Equipment Exhibition to be held at Earls Court next April have decided to hold a special one-day conference on the subject as part of the exhibition. Mr. Gerald Nabarro, MP, originator of the bill, will open the conference.

The Builder

CURRENT PRICES OF MATERIALS

THE information given on these pages has been specially compiled for *The Builder* and is copyright. It is the intention that the details given should indicate fair average prices of materials, not necessarily the highest or the lowest. The prices apply to large quantities of materials loaded at works, delivered at London Stations or at site in London Area as stated. Prices for smaller quantities ex merchant's warehouse will necessarily be higher so as to include the stocking and handling costs involved. Due to the exceptional circumstances now prevailing it is recommended that the prices of materials should be confirmed by inquiry from suppliers and merchants.

AGGREGATES AND SAND

Delivered site in full lorry loads. Average of prices for Boroughs of Westminster, Paddington, Holborn and St. Pancras.

	£	s.	d.
Pit Ballast ... ... per yd.	1	7	1
Pit Sand ... ... ,,	1	4	6
Washed Sand ... ... ,,	1	7	8
¾ in. Shingle ... ... ,,	1	4	0
¼ in. Broken Brick ... ... ,,	1	0	9
Pan Breeze ... ... ,,		10	9
Fine or Coarse Foamed Slag Aggregate ... ... per ton	3	5	0
2 yds. of fine and 2.6 yds. of coarse per ton.			

CEMENT, etc.

Including non-returnable jute sacks or paper bags.

Best British Portland Cement. Standard Specification delivered Charing Cross area.			
6-ton loads and upwards, site ... ... per ton	5	12	0
1 to 6 tons, site ... ... ,,	6	4	0
Rapid Hardening Cement in 6-ton loads and upwards to site ... ... ,,	6	2	6
1 to 6 tons do. site ... ... ,,	6	14	6
Aquacrete Water Repellent Cement. 32s. 6d. per ton on ordinary cement prices.			
Sulphate Resisting Cement. 32s. 6d. per ton on ordinary cement prices.			
Red, Buff or Khaki Colorcrete in 6-ton lots ... ,,	8	12	0
Other colours according to colour.			
In 4-ton lots from 310s. 0d. to 780s. 0d. per ton.			
White Portland Cement ... ... ,,	13	17	6
Under 1 ton ... ... per cwt.		16	11
417 Cement (Ultra Rapid Hardening) in 6-ton lots and upwards ... ... per ton	7	4	6
Super Cement (Waterproof), 32s. 6d. per ton above Portland Cement.			
Cullamix Tyrolean Finish, £11 10s. 0d. to £14 5s. 0d. (1-ton loads and upwards).			
Lightning and Ciment Fondu Brands High Aluminous cement, 6-ton lots and up ... ... ,,	15	14	6
Stourbridge Fireclay, 6-ton loads at Railway Depot, London ... ... ,,	6	17	6
Moler Mortar Powder for Flue Bricks (London sites) ... ... per cwt.	1	10	0

BRICKS

Full Loads.			
First Hard Stocks ... ... per 1,000	13	14	6
Second Hard Stocks ... ... ,,	12	13	6
Mild Stocks (Kiln Burnt) ... ... ,,	9	4	0
Mild Stocks ... ... ,,	8	19	0
All loaded free into lorry at the works. The question of haulage is still very difficult and prices must be obtained from job to job.			
2½in. Nominal Fletton Bricks to sites in W.C.			
District Commons ... ... ,,	5	18	0
Cellular do. ... ... ,,	5	18	0
Keyed do. ... ... ,,	6	0	0
Rustics ... ... ,,	7	10	0
Cellular Rustics ... ... ,,	7	10	0
Single Bullnose Commons ... ... ,,	7	12	6
Sandfaced ... ... ,,	8	10	0
Tuscans ... ... ,,	9	5	0
Saxons ... ... ,,	9	13	0
Golden Buffs ... ... ,,	10	0	0
Dapple Light ... ... ,,	10	7	6
Best Blue Pressed Staffs (London Stations) ... ,,	29	15	6
,, Bullnose (London Stations) ... ... ,,	30	9	6
Blue Wire Cuts (London Stations) ... ... ,,	26	15	6
Midhurst Lime Bricks (London sites) ... ... ,,	10	15	6
Uxbridge Whites (London sites) ... ... ,,	10	2	0
Special Purpose Sandlime Bricks (London sites) ... ,,	7	18	6
2½ in. Best Stourbridge Fire Bricks (London Stations) ... ... ,,	29	9	9
3 in. do. (London Stations) ... ... ,,	35	7	9
2½ in. Moler Flue Bricks (London sites) ... ... ,,	36	0	0
2½ in. Machine-made Sandfaced Red Facings (London sites) ... ... ,,	15	18	6
2½ in. Machine-made Multi Red Facings (London sites) ... ... ,,	16	3	6
2½ in. Hand-made Sandfaced Red Facings (London sites) ... ... ,,	15	18	6
2½ in. Hand-made Sandfaced Multi-Colour Facings (London sites) ... ... per 1,000	16	13	6
Hand-made Sandfaced Cherry Red Facings, Berkshire district (London sites) ... ... ,,	18	14	0
Hand-made Sandfaced Multi-Colour Facings. Berkshire district (London sites) ... ... ,,	18	14	0
Rubber Bricks for gauged arches (London sites) ... ,,	42	17	6
2½ in. Surrey Clamp Burnt Multi Stock Facings (London sites) ... ... ,,	14	4	0
2½ in. Surrey Kiln Burnt Multi Stock Facings (London sites) ... ... ,,	15	16	0
Glazed Bricks (London sites), White, Ivory, Brown—			
Stretchers ... ... ,,	64	0	0
Headers ... ... ,,	63	0	0
Quoins, Bullnose and 4½ in. Flats ... ... ,,	80	0	0
Double Stretchers ... ... ,,	85	0	0
Double Headers ... ... ,,	77	10	0
One side and two ends ... ... ,,	87	0	0
Two sides and one end ... ... ,,	89	10	0
Splays and Squints ... ... ,,	83	0	0
Cream and Buff £3 extra over White. Other colours, hard glaze, £8 10s. 0d. extra over White. All above prices plus 32½% for Best quality and plus 32½% less 10% for Second quality.			

PARTITION SLABS, etc.

Delivered Central London Area. (W.C. District.)

Hollow Clay Partition Blocks (Keyed)			
	Minimum lorry loads		
*2 in. ... ... 140 yds. ... ... per yd. sup.		4	5
*2½ in. ... ... 140 yds. ... ... ,,		4	8
*3 in. (3 cavity) ... 120 yds. ... ... ,,		5	5
Building Blocks (Keyed)			
*3 in. (6 cavity) ... 110 yds. ... ... ,,		5	7
*4 in. (6 cavity) ... 95 yds. ... ... ,,		6	10
6 in. (8½ in. × 5⅝ in.) 1,250 blocks ... ... per 1,000	26	18	0
*Half blocks at no extra charge.			
Clinker Concrete			
2 in. ... ... 100 yds. ... ... per yd. sup.		3	9
2½ in. ... ... 85 yds. ... ... ,,		4	4
3 in. ... ... 75 yds. ... ... ,,		5	3
4 in. ... ... 55 yds. ... ... ,,		6	5
Cranham			
2 in. ... ... ,,		6	9
2½ in. ... ... ,,		7	5
3 in. ... ... ,,		8	9
4 in. ... ... ,,		10	9
4½ in. Load bearing quality ... ... ,,		11	10
Moler Partition Blocks			
2 in. ... ... 150 yds. ... ... ,,		15	0
2½ in. ... ... 120 yds. ... ... ,,		15	6
3 in. ... ... 100 yds. ... ... ,,		16	0
4 in. ... ... 90 yds. ... ... ,,		19	0
Lightweight Concrete Building and Partition Blocks of Various Sources of Manufacture			
2 in. ... ... 100 yds. ... ... ,,		5	10
2½ in. ... ... 80 yds. ... ... ,,		7	0
3 in. ... ... 65 yds. ... ... ,,		8	2
4 in. ... ... 50 yds. ... ... ,,		9	8
4½ in. ... ... 44 yds. ... ... ,,		10	4
6 in. ... ... 33 yds. ... ... ,,		13	10½
Thermalite-Ytong Partition Blocks			
2½ in. ... ... 144 yds. ... ... ,,		7	0
Thermalite-Ytong Loadbearing Insulating Blocks			
3 in. ... ... 120 yds. ... ... ,,		8	5
4 in. ... ... 90 yds. ... ... ,,		11	0
5 in. ... ... 72 yds. ... ... ,,		13	9
6 in. ... ... 60 yds. ... ... ,,		16	6
8½ in. ... ... 42 yds. ... ... ,,	1	3	8
Floor Blocks and Filler Tiles			
3 in. Floor Blocks 12 in. by 12 in. delivered in full lorry-loads ... ... per 1,000	34	1	0
4 in. do ... ... ,,	36	10	0
5 in. do. ... ... ,,	43	15	0
6 in. do. ... ... ,,	49	19	0
7 in. do. ... ... ,,	61	8	0
8 in. do. ... ... ,,	71	19	0
12″ × 3″ × ⅝″ Filler Tiles in multiples of 10 tiles per 1,000 multiples	42	15	0
12″ × 4″ × ½″ do. do.	73	15	0

STONEWARE DRAIN PIPES, etc.

The following are the percentages to be added to the Revised Standard List (Nov., 1956) prices delivered London Area.

Delivered ex Merchants Wharf or Depot or Manufacturers Works.

	Over 2 tons	Over 100 pieces Under 2 tons	Under 100 pieces Under 2 tons
Best Quality ...	−2½%	+15%	+22½%
BSS Best do. ...	+10% −2½%	+10% +15%	+10% +22½%
Tested Quality ...	+37½% −2½%	+37½% +15%	+37½% +22½%
BSS Tested do.	+47½% −2½%	+47½% +15%	+47½% +22½%

STONEWARE DRAIN PIPES, etc.—*continued*

	£	s.	d.
3 in. Land Drain Pipes (in 12 in. lengths) ... per 1,000	11	10	6
4 in. do. ... ... ,,	15	3	6
6 in. do. ... ... ,,	31	9	0
9 in. do. ... ... ,,	58	13	0

DAMP COURSE

Hessian base bitumen 7 lb. per yd. sup. in 24 ft. rolls cut to wall widths in lots of £6 value and over delivered London area ... ... per yd. sup.		3	5½
Asbestos base ditto 7 lb. per yd. sup. do. do. ,,		5	3
Lead lined bitumen ditto 9½ lb. per yd. sup. do. ,,		12	2
18 in. × 9 in. British damp course slates ... ... per 1,000	43	8	11
14 in. × 9 in. do. do. ... ... ,,	32	8	2
9 in. × 9 in. do. do. ... ... ,,	18	18	9
18 in. × 4½ in. do. do. ... ... ,,	19	19	9
14 in. × 4½ in. do. do. ... ... ,,	15	18	3
9 in. × 4½ in. do. do. ... ... ,,	10	14	3

STONE

Bath Stone—			
Monks Park ... ... per ft. cube		9	4
St. Aldhelm Box Ground ... ... ,,		10	7
Delivered in railway trucks at South Lambeth B.R. Western Region.			
Doulting Stone Random Blocks. Delivered London area ,,		9	2
Beer Stone. Delivered London area ... ... ,,		8	9
Portland Stone—			
Brown Whitbed in random blocks, 20 ft. average delivered in railway trucks at Nine Elms, B.R. Southern Region ... ... ,,		8	8
Yorkshire Stone—Blue Robin Hood Quality. Delivered to site London in 6-ton lots.			
9 in. × 3 in. Rubbed, weathered, throated and stooled cills ... ... per ft. cube	4	1	9
12 in. × 6 in. do. do. ... ... ,,	2	18	3
12 in. × 3 in. Plain coping, twice throated ... ,,	2	5	3
12 in. × 3 in. Weathered and twice throated coping ,,	3	0	3
14 in. × 6 in. do. do. ... ... ,,	2	14	3
4½ in. × 9 in. Plinth rubbed on top and face ... ,,	2	8	6
3 in. sawn two sides Slabs, random sizes ... ... per ft. sup.		8	8
Templates and Cover Stones, 3 in., 4 in. and 6 in. thick, edges coped for rendered brickwork ... per ft. cube	1	9	9
do. do. fair one edge for fair faced brickwork ... ... ,,	1	15	3
Hard York—			
12 in. × 2 in. Square Steps, rubbed on top and edge per ft. run		10	6
14 in. × 3 in. Round-nosed Steps, rubbed on top and front ... ... per ft. cube	2	15	6
12 in. × 6 in. Plain Steps, rubbed top and front ,,	2	8	6
2 in. Rubbed and Jointed Paving, given sizes ... per ft. sup.		9	9
2 in. Sawn Paving, edges squared, in random sizes per yd. sup.	3	8	6

TILES AND PANTILES

Delivered London area by road in 6 tons or over per 1,000			
Machine-made Pantiles and French pattern Tiles from Lincolnshire district	29	19	0
Hand-made Pantiles Berkshire district	55	18	0
Hand-made Double Roman Bridgwater district	60	11	6
Hand-made 10½ × 6½ tiles Berkshire district	15	9	0
Machine-made 10½ × 6½ Staffordshire district	14	13	6
Hand-made Hip and Valley tiles per doz.	1	11	3
Machine-made Hip and Valley tiles do.	1	9	6
Concrete tiles 10½ × 6½	8	10	0
do. Interlocking (49S)	19	16	6

NOTE.—Breakage in transit, purchasers' responsibility.

SLATES

First-quality Slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate Station. Per 1,000 actual.			
24 × 12	143	15	10
22 × 12	116	17	4
22 × 11	105	10	10
20 × 12	99	0	1
20 × 10	94	16	9
18 × 10	65	16	9
18 × 9	57	14	0
16 × 10	51	17	0
16 × 8	40	11	9

NOTE.—Breakage in transit, purchasers' responsibility.

TIMBER

Softwood—			
Joinery quality ... ... Ex Wharf per standard	£115 to £140		
Carcassing quality ... do. ,,	£97 to £102		
1 in. Tongued and Grooved Flooring do. ,,	£110	0	0
Hardwood—			
Mahogany—African S.E. do. per ft. cube	1	10	0
do. Honduras do. do. ,,	3	5	0
Oak European do. do. ,,	2	5	0
do. Japanese do. do. ,,	2	10	0
do. English Logs sawn do. ,,	2	0	0
Teak 8 in. average S.E. do. ,,	3	17	6
Walnut African Logs sawn do. ,,	1	5	0

DOORS (in Lots I-II)

Delivered London area	£	s.	d.
1¼ in. 4 Horizontal Panel. Pattern 4 in. deal			
2 ft. 0 in. × 6 ft. 6 in. ... ... each	1	16	0
2 ft. 3 in. × 6 ft. 6 in. ... ... ,,	1	17	6
2 ft. 6 in. × 6 ft. 6 in. ... ... ,,	1	18	6
2 ft. 9 in. × 6 ft. 6 in. ... ... ,,	2	0	6
2 in. do. but top panel open. Pattern 4 × G in deal			
2 ft. 6 in. × 6 ft. 6 in. ... ... ,,	2	9	0
2 ft. 9 in. × 6 ft. 6 in. ... ... ,,	2	11	6
2 in. 2 Panel top panel open. Pattern 2 × G in deal			
2 ft. 6 in. × 6 ft. 6 in. ... ... ,,	2	3	0
2 ft. 9 in. × 6 ft. 6 in. ... ... ,,	2	5	0

SUNDRIES

Delivered London area.			
1 in. Wood Wool Slabs 6 ft. 0 in. × 2 ft. 0 in. in quantities of 1 ton (89 yds. to 1 ton) ... ... per yd.		6	2
1½ in. do. (67 yds. to 1 ton) ... ... ,,		8	0
2 in. do. (52 yds. to 1 ton) ... ... ,,		9	9½
2½ in. do. (45 yds. to 1 ton) ... ... ,,		11	3
3 in. do. (39 yds. to 1 ton) ... ... ,,		12	7½
Quantities under 1 ton add 1d. per ½ in. of thickness.			
½ in. imported insulation Board, quantities over 5,000 sq. ft. per 100 sq. ft.	2	2	6
⅛ in. Hardboard do. ... ... ,,	2	1	6
3/16 in. do. do. ... ... ,,	3	2	6
1/16 in. Asbestos Flat Building Sheets ... per yd. sup.		4	3
¼ in. do. ... ... ,,		5	9½
Roofing Felt 1-ply ... ... ,,		1	9
do. 2-ply ... ... ,,		2	2½
Best Scotch Glue in slabs ... ... per ½ cwt.	5	0	0
do. pearl ... ... ,,	5	5	0
Croid Glue ... ... 28 lb.	2	6	0
Cut Nails 3 in. (1-ton. lots) ... ... per ton	73	0	0
do. 4 in. and up (1-ton lots) ... ... ,,	69	10	0
Wire Nails 3 in. (4-cwt. lots) ... ... per cwt.	3	13	11
do. 4 in. and up (4-cwt. lots) ... ... ,,	3	13	3

METALS

STEEL JOISTS, ETC.

Basis Joists—			
6 in. × 5 in., 8 in. × 5 in., 8 in. × 6 in., 10 in. × 6 in., 12 in. × 6 in. plain cut to lengths delivered London area ... ... per ton	51	2	6
Extra for sizes			
3 in. × 1½ in. 4 in. × 1¾ in. ... ... ,,	3	10	0
3 in. × 3 in. ... ... ,,	2	10	0
4 in. × 3 in. ... ... ,,	2	5	0
10 in. × 4½ in. ... ... ,,	1	10	0
5 in. × 2½ in. 5 in. × 3 in. ... ... ,,	1	15	0
4½ in. × 1½ in. ... ... ,,	3	5	0
5 in. × 4½ in. 7 in. × 3½ in. 13 in. × 5 in. ,,		15	0
6 in. × 3 in. 24 in. × 7½ in. ... ... ,,	2	0	0
6 in. × 4½ in. 7 in. × 4 in. 8 in. × 4 in. 9 in. × 4 in. 10 in. × 5 in. ... ... ,,	1	5	0
12 in. × 5 in. 22 in. × 7 in. ... ... ,,	1	0	0
9 in. × 7 in. 10 in. × 8 in. 12 in. × 8 in. 14 in. × 5½ in. 14 in. × 6 in. 14 in. × 8 in. 15 in. × 5 in. 15 in. × 6 in. 16 in. × 6 in. 16 in. × 8 in. 18 in. × 7 in. 18 in. × 8 in. 20 in. × 6½ in. 20 in. × 7½ in. ,,		10	0
Steel angles average price ... ... ,,	53	2	6
Steel tees average price ... ... ,,	54	2	6
Fabricated work delivered London—			
R.S. Joists cut and fitted ... ... ,,	70	12	6
Compound girders ... ... ,,	77	0	0
Stanchions ... ... ,,	82	10	0
Compound stanchions ... ... ,,	87	0	0
In Roof Work—Trusses and Purlins ... ... ,,	100	12	6
Average prices not for awkward work.			
Angle cleats and ⅝ in., ¾ in. and ⅞ in. bolts average price London area ... ... per cwt.	5	19	0

FERRO-CONCRETE BARS

Mild Steel Ferro-Concrete bars British manufacture to BSS785 ex London Stock ⅝ in. diam., and upwards ... ... per ton	49	17	6
¼ in. diam. ... ... ,, extra	8	12	6
5/16 in. do. ... ... ,,	6	12	6
⅜ in. do. ... ... ,,	4	12	6
½ in. do. ... ... ,,	3	2	6

MILD STEEL TUBES

Tubes to BSS1387 and Fittings. List prices and following discounts :

Galvanised Tube—	Under 1 ton	Over 1 ton	W.I. Fittings	Malleable Fittings
Class A	+24¼ %	+21 %	Light +48 %	Malleable List
Class B	+37 %	+33⅓ %	Heavy +55½ %	−20½ %+40%
Class C	+57 %	+53¼ %		
Black—				
Class A	+ 4½ %	+ 1½ %	Light +35¾ %	Malleable List
Class B	+18¼ %	+15 %	Heavy +43¼ %	− 20½ %
Class C	+34½ %	+31¼ %		

C.I. HALF-ROUND GUTTERS

Delivered London per yd. in 6-ft. lengths

	Gutters	Nozzles	Stop Ends
3 in.	4/0½	3/7	1/–
3½ in.	4/4½	3/11	1/–
4 in.	5/8	4/5	1/7
4½ in.	6/3	4/11	1/10
5 in.	6/11½	5/4	2/2

METALS—*continued*

C.I.O.G. Gutters

	Gutters	Nozzle	Stop Ends
3 in.	5/2½	4/8	1/3
3½ in.	5/10	4/8	1/7
4 in.	6/5	4/11	1/10
4½ in.	6/11½	5/8	2/2
5 in.	7/7½	6/5	2/6

C.I. Rain-water Pipes

Per yd. in 6-ft. lengths	Pipe	Bends	Branches
2 in.	8/7½	4/5	6/4
2½ in.	8/7½	4/11	8/6
3 in.	9/8½	6/2	9/2
3½ in.	11/0½	7/3	11/–
4 in.	12/9	8/9	13/1

L.C.C. Coated Soil Pipes

2 in.	9/8½	7/7	9/2
2½ in.	10/4	8/5	11/5
3 in.	11/7	9/2	13/7
3½ in.	12/11½	11/5	15/10
4 in.	14/9	12/9	18/8

Above prices for gutters, rain-water and soil pipes for under 5 cwt. lots only. Lots over 5 cwt. see List No. 3300 dated February 1, 1955, plus 22½% and tonnage allowance. 4-ton lots 5 per cent., 2-ton lots 2½ per cent.

L.C.C. Coated Drain Pipes

In 9-fts.

	cwt.	qt.	lb.	per yd.	Bends	Branches
4 in.	1	1	17	33/6	23/3	41/3
6 in.	2	0	1	49/2	62/–	99/–

Asbestos Rain-water Pipes and Fittings

All less 17½ per cent. discount.

		2 in.	2½ in.	3 in.	4 in.
Pipes 6-ft. lengths	per yd.	4/3	4/6½	5/6	7/3½
Shoes	each	2/9	3/–	3/7	4/10
Single Branches	,,	4/4	5/1	6/1	8/6
Bends square or obtuse	,,	3/–	3/4	4/4	6/1
Swan Necks 4½ in. proj.	,,	3/4	4/4	4/10	6/9
,, 6 in. ,,	,,	3/7	4/4	5/5	7/3

Asbestos O.G. Gutters and Fittings

		4 in.	4½ in.	5 in.	6 in.
Gutters 6 ft. lengths	per yd.	4/1	4/5½	5/4	6/4½
Drop ends	each	3/3	3/9	4/5	5/2
Stop ends	,,	1/–	1/1	1/2	1/4
Angles	,,	3/4	3/10	4/8	5/5
Nozzles	,,	3/3	3/9	4/5	5/2
Union Clips	,,	1/7	1/11	2/4	2/8

Asbestos Half-Round Gutters and Fittings

		3 in.	4 in.	4½ in.	5 in.	6 in.
Gutters 6 ft. lengths	per yd.	2/10	3/4½	3/5½	4/1	5/8
Drop ends	each	2/4	2/9	3/–	3/4	4/10
Stop ends	,,	–/11	1/–	1/1	1/2	1/4
Angles	,,	2/8	3/–	3/4	3/7	4/10
Nozzles	,,	2/4	2/9	3/–	3/4	4/10
Union Clips	,,	1/2	1/3	1/4	1/6	2/3

	Per ton basis in London £ s. d.
Iron—Staffordshire Crown Merchant Quality	49 7 6
Mild Steel Bars	47 12 6
Mild Steel Hoops	44 2 6

	Ex Merchant's Stock per ton Two-ton lots £ s. d.
Soft Sheets C.R. and C.A.—	
20 gauge	62 14 6
24 gauge	65 4 6
26 gauge	68 4 6
Galvanised Corrugated sheets 6 ft. to 9 ft.—	
20 gauge	71 12 0
24 gauge	75 2 0
26 gauge	80 7 0
Galvanised flat sheets C.R. and C.A.—	
20 gauge	73 2 0
24 gauge	76 12 0
26 gauge	81 17 0

ALUMINIUM AND ALUMINIUM ALLOYS

(Base prices)		£ s. d.
Sheet BS 1740 S1C 18 SWG (36 in. wide)	per lb.	2 11
Sheet BS 1470 NS3 Utility 18 SWG (36 in. wide)	,,	2 8½
Coiled strip BS 1470 S1C 18 SWG (24 in. wide)	,,	2 10
Coiled strip BS 1470 NS 3 Utility 18 SWG (24 in. wide)	,,	2 8
Coiled strip for flashing 99.7% purity 22 SWG (12 in. wide)	,,	3 0½
Corrugated sheet BS 1470 NS 3 Utility Circular Profile 8 ft. × 32 in. × 20 SWG	per sheet	1 12 6
Corrugated sheet BS 1470 NS 3 Utility Industrial Profile 8 ft. × 31½ in. × 20 SWG.	,,	1 18 1
Corrugated sheet BS 1470 NS 3 Utility Mansard Profile 8 ft. × 31½ in. × 20 SWG	,,	1 11 7
Extruded section BS 1476 E1C simple moulding	per lb.	2 9
Extruded section BS 1476 E1C 1 in. diam. round	,,	2 6½
Extruded section BS 1476 HE1WP simple angle	,,	3 0
Extruded section BS 1476 HE10WP 1 in. diam. round	,,	2 11
Tubing BS 1471 T1C 1½ in. O/D × 20 SWG	,,	4 4½
Tubing BS 1471 HT10WP 1½ in. O/D × SWG	,,	5 8

PLUMBERS' BRASS WORK, etc.

Delivered in London area.

M.O.H.

All per doz.	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Screwdown bib cocks Crutch head for iron	87/–	128/8				
Toilet bib cocks for iron	109/–	158/5				
Screwdown stop cocks for iron	66/–	95/9	188/–	363/–	522/6	917/6
do. with two unions for lead	89/–	132/–	234/4	472/–	623/6	1389/6
Double nut boiler screws	18/8	26/5	47/6	48/6	67/–	93/6
Heavy Croydon ball valves	77/–	193/6	312/5	568/8	734/10	—
Plumbers' union brass lead to iron	19/6	23/6	38/6	52/10	70/6	165/–
	1¼ in.	1½ in.	2 in.	3 in.	3½ in.	4 in.
Caps and screws	33/–	40/8	59/6	92/5	118/10	155/3
Brass sleeves		31/11	31/11	56/2	74/10	91/5
	1¼×6 lb.		1½×6 lb.	2×7 lb.		3×7 lb.
Lead P. trap with brass cleaning screws	68/6		85/6	137/–		234/–
Lead S. trap do.	83/–		102/6	168/3		302/–

Solder		s. d.
Plumbers'	1 cwt. lots	332/– 14 lb. lots per lb. 3 6
Tinmen's	,, ,,	408/– ,, ,, 4 1
Blow pipe	,, ,,	411/– ,, ,, 4 3

Copper Tubes and Sheets

Copper tubes BSS 659/1944 on the basic price of 23½d. per lb. plus gauge and manufacturing extras as follows. Minimum quantities, 3 cwt.

	Extra d.		d.
⅛ in. × 19 gauge	14¾	Total per lb.	37⅞ approx per ft. 10½
¼ in. × 19 ,,	13	,, ,,	36½ ,, ,, 14
1 in. × 18 ,,	11½	,, ,,	34⅝ ,, ,, 21½
1¼ in. × 18 ,,	10⅞	,, ,,	34 ,, ,, 26
1½ in. × 18 ,,	10⅞	,, ,,	34 ,, ,, 31
2 in. × 17 ,,	12½	,, ,,	35⅝ ,, ,, 50

Rolled Copper sheets up to 48 in. wide, basic price plus gauge and manufacturing extras ... ... per ton £217 0 0

Zinc

		£ s. d.
Sheet Zinc	10 gauge (25 SWG) 5 cwt. lots upwards per cwt.	7 7 0
do.	12 gauge (23 SWG) ,, ,,	7 5 9
do.	14 gauge (21 SWG) ,, ,,	7 4 6

Brass Tubes

Brass tubes basic price, plus gauge and manufacturing extras ... ... per lb. 1 7½

LEAD SHEET AND PIPES

Basis selling price in minimum one-ton delivery to one address in London or Home Counties.

		£ s. d.
Lead Sheet, English, 3½ lb. substance and upwards	per ton	130 5 0
Lead Water Pipe in coils	,,	132 10 0
Lead Soil Pipe 10 ft. or over 2 in. to 4 in. dia.	,,	134 0 0
,, over 4 in. dia.	,,	136 0 0
Lead Gas or Untinned Compo pipe	,,	134 0 0
Extras over Basis for quantities under 1 ton		
5 cwt. and under 1 ton	per cwt.	2 0
3 cwt. do. 5 cwt.	,,	4 0
1 cwt. do. 3 cwt.	,,	6 0

Smaller quantities than 1 cwt. priced specially.

Supplying sheet lead and lead pipe to less than basis weights and cutting to sizes less than basis charged extra according to current trade schedule.

Allowance for Old Lead, collected £80 15s. 0d. per ton weighed at buyer's works.

PLASTER, etc.

		£ s. d.
Coarse Pink in 1-ton loads and over Delivered on Site	per ton	8 9 6
do. White do. do.	,,	8 19 0
Siripite Coarse do. do.	,,	8 10 6
do. Fine do. do.	,,	8 18 6
Blue Lias Lime in 6-ton loads	,,	6 14 6
Hydrated Lime (Grey) do.	,,	5 17 6
do. (White) do.	,,	6 5 0
Lump Lime (Grey) do.	,,	5 7 0
do. (White) do.	,,	5 14 6
White Keen's or Parian Cement in 1-ton loads	,,	12 4 6
Pink Keen's or Parian Cement in 1-ton loads	,,	11 19 3
Granite Chips in 6-ton loads	,,	2 8 6
Hair	per cwt.	4 17 6
Gypsum Plaster Lath or Base Board ⅜ in. thick 600 yds. and over in one delivery. Delivered site	per yd.	2 5
1,200 yds.	,,	2 4
Do. Insulating do. ⅜ in. thick 600 yds. and over in one delivery. Delivered site	,,	3 0
1,200 yds.	,,	2 11½
Gypsum Plaster Wall Boards, 3 and 4 ft. wide, 6 to 12 ft., ⅜ in. thick, 600 yds. and over in one delivery Delivered site	,,	2 8
1,200 yds.	,,	2 7
Do. Insulating do. ⅜ in. thick 600 yds. and over in one delivery. Delivered site	,,	3 3
1,200 yds.	,,	3 2½

PAINT AND DISTEMPER

		£	s.	d.
Delivered London area				
Ceiling Distemper	per cwt.	1	7	6
Washable Distemper	„		5	5	0
Gloss Paint	per gal.	2	12	0
Snowcem cement paint (in 1 cwt. drums)	per cwt.	3	11	0
LEAD PRODUCTS AND OILS				
Ground White Lead, in 1 cwt. kegs	per cwt.	8	18	3
Genuine White Lead Paint, 1-19 gal. lots in 1 gal. tins	per gal.	3	9	6
Genuine Red Lead, Dry, 1 cwt. keg.	per cwt.	6	9	6
Genuine Linseed Oil Putty, 1 cwt. keg	„	2	14	0
Size XD quality 28 lb.	per tin		9	0
Raw Linseed Oil (5 gal.) drums extra	per gal.		18	6
Boiled Linseed Oil (5 gal.) do.	„		19	0
SUNDRIES				
Turpentine substitute (5 gal.) drums extra	„		5	3⅞
do. do. (40 gal.) do. do.	„		4	7⅛
Solignum, Brown (5 gal. cans) Exterior	„		8	4
Creosote (40 gal. barrels)	„		2	3
Paste Powder (1 lb. packets)	per lb.		1	10
White Lining Paper	per piece		1	2½

VARNISHES, etc.

		£	s.	d.
Delivered London area				
Oak Varnish, Outside or Inside	per gal.	2	0	0
Oak Pale Copal do.	„	2	0	0
Hard Drying Oak for Inside	„	2	5	0
Crystal Paper Varnish do.	„	2	8	0
Eggshell Flat Varnish do.	„	2	6	0
Finest Carriage Varnish	„	2	7	0
Front Door Varnish	„	2	4	0
Japan Gold Size	„	1	18	0
Black Japan	„	1	16	0
Brunswick Black	„	1	12	0
Berlin Black	„	1	10	0
Terebene	„	1	17	0
Knotting (1 gal. bottles free)...	„	2	8	0
French and Brush Polish (do.)	„	2	2	0

GLASS

	per ft. super s.	d.
Delivered London area		
18 oz. Sheet Glass Ordinary Glazing Quality-Cut Sizes		7⅞
24 oz. „ „ „ „ „ „		10⅜
26 oz. „ „ „ „ „ „	1	0½
32 oz. „ „ „ „ „ „	1	4½
¼ in. Rolled Plate		11¼
⅛ in. Rolled and Rough Cast	1	3
⅛ in. „ „ „ „	1	3¾

	per ft. super s.	d.
⅛ in. Figured Rolled and Cathedral, Standard patterns :		
White Group 1		11½
do. Group 2	1	3½
do. Standard Tints	1	10
do. Special Tints	6	8
⅛ in. Pinstripe, Hammerstripe, Reeded, Reedlyte and Luminating Group 3	1	4⅜
¼ in. Wired Cast	1	7½
¼ in. Georgian Wired Cast...	1	7½
Hollow Glass Blocks—	Each	
P.B.2. 5¾ × 5¾ × 3⅞ in.	3	3
P.B.3 7¾ × 7¾ × 3⅞ in.	5	0
P.B.32 7¾ × 7¾ × 3⅞ in.	5	0
Radiused Corner Blocks to match up with—		
P.B.2	6	0
P.B.3	7	6
P.B.32	7	6
¼ in. Polished Plate Glass, G.G. Quality—	Per ft. super	
In plates not exceeding 2 ft. sup.	4	3
„ „ „ 5 ft. sup.	5	3
„ „ „ 45 ft. sup.	6	3
„ „ „ 100 ft. sup.	6	9
¼ in. Polished Plate, extra sizes, *i.e.*, plates exceeding 100 ft. sup. or 160 in. one way or 96 in. both ways. G.G. quality—Not exceeding 135 ft. sup. or 250 in. one way or 135 in. both ways	10	0
Not exceeding 180 ft. sup. or ditto	13	4
Plates exceeding 130 ft. sup. prices on application.		
Substances other than ¼ in. Polished Plate at Special Prices.		

Quantity Tariff—Sheet and Sundry Glass.

The following prices apply to minimum quantities of one size and one pattern delivered by the manufacturer to one site at one time.

Description of Glass	Minimum quantity	Per ft. sup. s.	d.
18 oz. sheet O.Q.	3,000		5⅛
24 oz. „ „	2,000		7⅞
26 oz. „ „	2,000		9½
32 oz. „ „	2,000	1	1½
¼ in. Rolled Plate	1,000		8⅛
⅛ in. Figured Rolled and Cathedral Standard Patterns, White Group 1	1,000		8⅛
do. Group 2	1,000		10¼
⅛ in. Pinstripe, Hammerstripe, Reeded, Luminating and Spotlyte Group 3	1,000		11⅞
⅛ in. and ¼ in. Rolled Plate or Rough Cast ...	2,000	1	0
¼ in. Wired Cast, Hexagonal	2,000	1	2
¼ in. Georgian Wired Cast	2,000	1	2½

The Builder

CURRENT RATES OF WAGES

AS FROM MAY 27, 1957. (Every endeavour is made to ensure accuracy but we cannot be responsible for errors.)

KEY TO SCHEDULE OF GRADE RATES.

Grade Classification.	A	A1
Craftsmen	4/6	4/5½
Labourers	3/11½	3/11

Town.	*Grade.*
Aberavon	A
Aberdare	A
Abergavenny	A
Abingdon	A1
Accrington	A
Addlestone	A
Afan Valley	A
Aldeburgh	A1
Aldershot District	A1
Alfreton UD	A
Alnwick UD	A
Altrincham	A
Amble	A
Ambleside	A1
Amersham	A1
Ammanford	A
Andover	A1
Anglesey, Isle of	A1
Ardingly	A1
Arundel	A1
Ascot	A1
Ashbourne RD	A1
Ashbourne UD	A1
Ashby-de-la-Zouch UD	A
Ashby Woulds UD	A
Ashford (Kent)	A1
Ashford (Middlesex)	A
Ashington UD	A
Ashtead	A
Ashton-under-Lyne	A
Aspatria and Brayton	A1
Atherstone RD	A
Attleborough	A1
Axminster	A1
Aylesbury	A1
Aylsham	A1
Bagshot	A1
Bakewell UD	A1
Banbury	A1
Bangor	A1
Barnard Castle UD	A
Barnoldswick UD	A
Barnsley CB	A
Barnstaple	A1
Barrow-in-Furness	A
Barrow-upon-Soar RD (part Thrussington)	A1
Barry	A
Basford RD (exc. Willough-by-on-the-Wolds A1)	A
Basingstoke	A1
Bath	A
Batley MB	A
Baxterley	A1
Beaconsfield District	A
Bearl	A
Beccles	A1
Bedale RD	A
Bedford	A
Bedlington	A
Bedlingtonshire UD	A
Bedwas	A
Beeston & Stapleford UD	A
Belper UD	A
Belton	A
Berkhamsted	A
Berrington	A1
Berwick Borough	A
Beverley MB	A
Bewdley MB	A
Bexhill-on-Sea	A1
Bideford	A1
Biggleswade	A1
Billericay	A
Billing	A
Billingham UD	A
Bilsthorpe	A
Bilston MB	A
Birchington	A1
Birkenhead	*
Birmingham CB	†A
Bishop Auckland UD	A
Bishop's Stortford	A
Bishops Castle MB	A1
Bispham	A
Blackburn	A
Blackpool	A
Blackwell RD	A
Blandford	A1
Blaydon UD	A
Blidworth	A
Blyth B.	A
Bodmin	A1
Bognor Regis	A1
Boldon UD	A
Bolsover UD	A
Bolton	A
Boston MB	A
Bourne End	A
Bournemouth District	A
Brackley MB	A1
Bracknell	A1
Bradford CB	A
Bradford-on-Avon	A1
Braintree	A1
Brandon & Byshottles UD	A
Brecon—Borough of	A1
Breconshire, County of ...	‡A1
Brent Knoll	A1
Brentwood	A
Bridgend	A
Bridlington MB	A
Bridlington RD	A1
Bridgnorth MB	A1
Bridgnorth RD	A1
Bridgwater	A1
Brierfield	A
Brighouse MB	A
Brighton & Hove	A
Bristol District	A
Broadstairs	A1
Bromsgrove UD	A
Broughton, Flint	A
Buckfastleigh	A1
Buckingham	A1
Buckley	A
Bungay	A1
Burnham-on-Crouch	A1
Burnham-on-Sea	A1
Burnley	A
Burton-on-Trent C.B.	A
Bury	A
Bury St. Edmunds	A1
Buxton	A
Byfleet	A1
Caernarvon	A1
Caernarvonshire, Cnty. of	‡A1
Calder Valley	A
Camberley District	A1
Cambridge	A
Cannock UD	A
Canterbury	A1
Cardiff	A
Cardiganshire, County of	‡A1
Carlisle	A

CURRENT RATES OF WAGES—Continued

Town.	Grade.
Carlton UD	A
Carmarthen—Borough of	A1
Carmarthenshire,Cnty of	‡A1
Carnforth	A
Castleford UD	A
Caterham	A
Chapel-en-le-Frith	A
Chard	A1
Charmy Down	A
Chatham District	A
Chatteris	A1
Cheadle (Staffs) RD	A
Chelmsford	A
Cheltenham	A
Chepstow	A
Chertsey	A
Chester	A
Chester-le-Street UD	A
Chesterfield MB	A
Chesterfield RD	A
Chichester	A1
Chipping Norton	A1
Chipping Sodbury	A1
Chippenham (inc. Chippenham Within and Hardenhuish)	A1
Chorley	A
Cirencester	A1
Clacton	A1
Clay Cross UD	A
Cleethorpes MB	A
Clevedon	A1
Cleveleys	A
Clitheroe	A
Coalville UD	A
Cobham (Surrey)	A
Colchester	A
Colne	A
Colwyn Bay	A1
Congleton	A1
Consett UD	A
Conway	A1
Corby UD	A
Cornwall, County of	‡A1
Corsham District	A
Coventry CB	A
Cranbrook	A1
Cranleigh	A1
Cranwell Aerodrome Site	A
Crawley	A1
Crewe	A
Crewkerne	A1
Cromer	A1
Crook and Willington UD	A
Crowborough	A1
Cuckfield	A1
Cwmbran	A
Dalton-in-Furness	A
Darlington CB	A
Dartmouth	A1
Darwen	A
Daventry MB	A1
Deal	A1
Denbigh Town	A1
Derby CB	A
Devizes	A1
Devon, County of	‡A1
Dewsbury CB	A
Didcot	A1
Diss	A1
Doncaster CB	A
Dorchester	A1
Dorking	A
Dorset, County of	A1
Dover	A1
Dovercourt	A
Driffield UD	A1
Drigg & Carleton	A
Droitwich MB	A
Dudley CB	A
Dunstable	A
Durham B	A
Eastbourne	A
E. Glam. & Mon. Val.	A
East Grinstead District	A1
East Kesteven RD	A1
East Retford MB	A
Eastwood (Notts) UD	A
Ebbw Vale & District	A
Edenbridge	A1
Ely	A1
Epping	A
Evesham MB	A1
Exeter	A
Exmouth	A1
Fakenham	A1
Falmouth	A1
Fareham	A
Faversham	A1
Felixstowe	A1
Filey UD	A
Fleetwood	A
Flint MB	A
Folkestone	A1
Frinton	A1
Frome	A1
Gainsborough UD	A
Gateshead CB	A
Gillingham (Dorset)	A1
Gillingham (Kent)	A
Glastonbury & Street	A1
Glossop	A
Gloucester	A
Gloucestershire, Cnty. of	‡A1
Godalming	A1
Goole, MB	A
Goole RD (part—Airmyn, Hook)	A
Gosport	A
Grantham MB	A
Gravesend	A
Grays Thurrock UD Area	A
Great Yarmouth	A
Grimsby CB	A
Grimsby RD (part)	A1
Guildford District	A1
Halesowen MB	A
Halifax CB	A
Halstead	A1
Haresfield	A1
Harlow	A
Harpenden	A
Harrogate MB	A
Hartlepool B	A
Harwell	A1
Harwich	A
Haslemere	A1
Hastings	A1
Hatfield (Herts)	A
Havant	A
Haywards Heath	A1
Heanor UD	A
Hemel Hempstead	A
Henley-on-Thames	A1
Hereford	A1
Herefordshire, Cnty. of	‡A1
Herne Bay	A1
Hertford	A
Hexham RD	A
Hexham UD	A
Heysham	A
Heywood	A
Higham Ferrers MB	A
High Wycombe	A
Hinckley UD	A
Hitchin	A
Hoddesdon	A
Holywell	A
Horley	A1
Horncastle UD	A1
Horsham	A1
Horwich	A
Huddersfield CB	A
Hull	A
Hunstanton	A1
Huntington (Staffs)	A
Ilfracombe	A1
Ilkeston MB	A
Ilkley UD	A
Ipswich	A
Isle of Sheppey	A1
Isle of Thanet	A1
Isle of Wight	A1
Jarrow B	A
Keighley MB	A
Kendal	A
Kenilworth UD	A
Kettering MB	A
Keynsham	A
Kidderminster MB	A
Kingskerswell	A1
King's Lynn	A1
Kingsteignton	A1
Kirkham	A
Knaresborough UD	A
Knutsford	A
Lancaster	A
Leamington MB	A
Leatherhead	A
Leeds CB	A
Leek UD	A
Leicester CB	A
Leighton Buzzard	A1
Leiston	A1
Leominster	A1
Letchworth	A
Lewes	A1
Lichfield MB	A
Lincoln CB	A
Liskeard	A1
Littlehampton	A1
Liverpool	*
Llandudno	A1
Llanelly (incl. Llanelly RD)	A
Llanfairfechan	A1
Llangollen	A1
London	*
Long Eaton	A
Looe	A1
Loughborough MB	A
Louth MB	A1
Lowestoft	A
Loxton	A1
Ludlow MB	A1
Ludlow RD	A1
Luton	A
Lyme Regis	A1
Lyneham (Devon)	A1
Lytham	A
Macclesfield	A
Maidenhead	A
Maidstone	A
Maldon (Essex)	A1
Maltby UD	A
Malton UD	A1
Malvern UD	A1
Manchester	A
Manningtree	A1
Mansfield MB	A
March	A1
Margate	A1
Market Harborough RD	A1
Market Harborough UD	A
Market Rasen UD	A1
Martock	A1
Maryport	A
Matlock UD	A
Melksham	A1
Melton Mowbray UD	A1
Merionethshire	A1
Merthyr	A
Mexborough UD	A
Middlesbrough CB	A
Middleton	A
Middlewich	A
Mildenhall	A1
Milford Haven UD	A1
Minehead	A1
Monmouth—Borough of	A1
Monmouthshire	A1
Morecambe	A
Moreton Valence	A1
Morley	A
Morpeth B	A
Morpeth RD	A
Mundesley	A1
Nantwich	A
Neath & Valley	A
Nelson	A
Newark MB	A
Newbury	A1
Newcastle-on-Tyne CB	A
Newcastle-under-Lyme	A
New Forest District	A1
Newmarket	A1
Newport, Mon.	A
Newport Pagnell	A1
Newquay	A1
Newton Abbot	A1
Normanton UD	A
Northallerton District	A
Northallerton UD	A
Northampton CB	A
North Shields	A
North Walsham	A1
Northwich	A
Norton Radstock	A1
Norwich	A
Nottingham CB	A
Nuneaton MB	A
Oakham RD	A1
Oakham UD	A1
Okehampton	A1
Oldham	A
Ongar	A
Ormskirk	A
Ossett & Horbury	A
Oswestry	A1
Oundle UD	A1
Oxford	A
Oxted	A1
Padstow	A1
Paignton	A1
Par	A1
Pembrokeshire (except Milford Haven)	A1
Penmaenmawr	A1
Penrith UD	A1
Penzance	A1
Peterborough, Soke of (Eastern Regional portion)	A1
Petersfield	A1
Pickering	A1
Plymouth	A
Pontefract MB	A
Pontypool & District	A
Pontypridd District	A
Porthcawl	A
Portishead	A
Portland Bill	A1
Portsmouth	A
Port Talbot	A
Preston	A
Princetown	A1
Pudsey MB	A
Pulborough	A1
Radnorshire, County of	‡A1
Ramsgate	A1
Raunds UD	A
Rayleigh	A
Reading	A
Redcar B	A
Redditch UD	A
Redhill & Reigate	A
Rhondda Valley	A
Richmond B (Yorks)	A
Ripon MB	A1
Rochdale	A
Rochester	A
Ross-on-Wye	A1
Rossendale Valley	A
Rotherham CB	A
Royston	A1
Rugby MB	A
Rugeley UD	A1
Rushden UD	A
Saffron Walden	A1
St. Albans	A
St. Austell	A1
St. Helens	A
St. Neots	A1
Salisbury City	A1
Salisbury Plain	A1
Sandy	A1
Sawbridgeworth	A
Saxmundham	A1
Scarborough MB	A
Scunthorpe MB	A
Seaford & Newhaven	A1
Selby UD	A
Sevenoaks	A
Shaftesbury	A1
Sheerness	A1
Sheffield MB	A
Shepton Mallet	A1
Sherborne	A1
Shipley	A
Shoeburyness	A
Shoreham	A
Shrewsbury MB	A
Sirhowy Valleys	A
Sittingbourne	A1
Skegness UD	A1
Skipton UD	A
Sleaford UD	A1
Slough, Windsor & Eton District	A
Smethwick CB	†A
Snettisham	A1
Solihull UD	A
Somerset, County of	‡A1
Southampton and Eastleigh	A
Southend-on-Sea Dist.	A
Southport	A
South Shields CB	A
Southwold	A1
Spalding UD	A1
Stafford MB	A
Staines	A
Stamford MB	A1
Stanstonwick	A
Stevenage	A
Stockport	A
Stockton RD	A
Stockton-on-Tees B	A
Stoke-on-Trent CB	A
Stoke Orchard	A1
Stourbridge MB	A
Stourport UD	A
Stowmarket	A1
Stratford-on-Avon MB	A
Stroud (RD Area)	A1
Sunderland CB	A
Sunningdale	A1
Sutton Coldfield MB	A
Swadlincote UD	A
Swaffham	A
Swanage District	A1
Swansea	A
Swindon District	A
Swinton UD	A
Tamworth MB	A
Taunton	A1
Tavistock	A1
Tenterden	A1
Teignmouth	A1
Tewkesbury	A1
Thames Haven	A
Thetford	A1
Thirsk RD	A
Thorpe Bay	A
Thurrock UDC Area	A
,, North of to Billericay	A
Tilbury	A
Todmorden MB	A
Tonbridge	A1
Torquay	A1
Totnes	A1
Tring	A1
Trowbridge	A1
Truro	A1
Tunbridge Wells	A1
Tynemouth CB	A
Ulverston	A
Uppingham (Salop)	A1
Uttoxeter RD	A1
Uttoxeter UD	A1
Wakefield CB	A
Wakefield RD	A
Walsall CB	A
Wallsend B	A
Walsden	A
Walton-on-Naze	A1
Ware	A
Warminster	A1
Warrington	A
Warwick MB	A
Wednesbury MB	A
Wellingborough UD	A
Wellington UD	A
Wellington (Somerset)	A1
Wells (Norfolk)	A1
Wells (Somerset)	A1
Welwyn	A
Welwyn Gar. City	A
West Bromwich CB	A
Westbury	A1
Westcliff-on-Sea	A
Westerham	A1
West Hartlepool CB	A
Westmorland (except Kendal)	A1
Weston-super-Mare	A1
Weybridge	A
Weymouth (including Portland Bill, excluding Portland Stoneyards)	A1
Whitby UD	A1
Whitby RD	A1
Whitehaven	A
Whitley & Monkseaton UD	A
Whitstable and District	A1
Wickford	A
Widnes	A
Wigan	A
Wigton	A1
Wilmslow	A
Wilts. County of	‡A1
Wimborne	A1
Wincanton	A1
Winchester	A1
Windermere	A1
Wisbech	A1
Witham	A1
Withernsea UD	A1
Woking	A1
Wokingham	A1
Wolverhampton CB	A
Wolverton District	A1
Woodbridge	A1
Woodhall Spa UD	A1
Woodstock	A1
Worcester CB	A
Workington	A
Worksop MB	A
Worthing	A1
Wrexham (incl. Cefn)	A
Wroughton	A1
Wylam	A
Wymondham	A1
Yate	A1
Yeovil Borough	A1
York CB	A
Ystalyfera	A

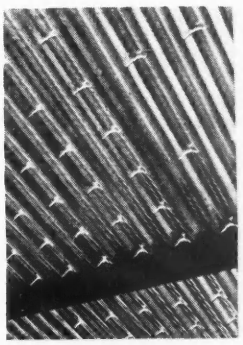
*For Birkenhead, Liverpool and London the rates are:—Craftsmen, 4s. 7½d.; Labourers, 4s. 1d. In the case of London the rate beyond the 12-mile radius is: Craftsmen, 4s. 7d.; Labourers, 4s. 0½d. †Plus 2d. per working day. ‡This is the County rate and applies except where higher grades are stated.

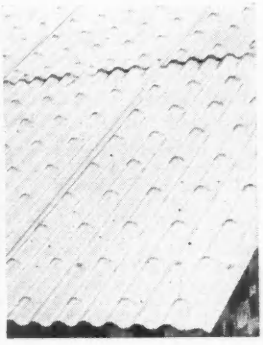
NOTE.—Carpenters and Joiners providing own tools when employed in establishments operating under the Supplementary Rules for Woodworking Factories and Shops, receive 2d. per day; when employed on other building industry work, 4d. per day.

WOMEN'S RATES.—In all districts throughout the country the rate of wages for women engaged in craft processes is 3s. 7½d. per hour. Women engaged on work other than craft processes, 3s. 3½d. per hour.

For Building Trade Wages in Scotland see page 564

The Builder Review of PLANT & MATERIALS





LOUVRED ROOFING.—Constant ventilation and a degree of lighting is afforded by 'Ventrex' louvred corrugated sheeting, by Ventrex, Ltd., from sheets supplied by Northern Aluminium Co., Ltd., Banbury, Oxfordshire. Basically it is a 3 in. pitch corrugated aluminium sheet with pressed louvres at 6 or 12 in. centres on every other corrugation

Electric Radiator

A NEW oil-filled electric panel radiator with a 1¼kW loading has been introduced by Hurseal, Ltd., 229, Regent-street, London, W1. It is suitable for a room of about 1,000 cu. ft., and it may be had fitted with feet or castors, coloured bronze, cream, white, gold, sky blue, eau-de-nil, etc. Size: 52in. by 26in. by ¾in. thick. It has an adjustable thermostat.

Foil Insulation

Hard-tempered aluminum foil, 0.04mm. thick, intended for use as an insulative material, is produced by Venesta, Ltd., of Vintry House, Queen Street-place, London, EC4, for P. H. Thermal Products, Ltd., of Westgate, Baildon, Yorkshire. Suggested positions for its use are under the roof, under floorboards and behind radiators.

Portable Panel Heater

A new portable floor-standing 'Radiant Glass' panel heater, which will be available for the coming heating season, is announced by E. K. Cole, Ltd., 5, Vigo-st., London, W1. Designed for operation on any voltage from 200 to 250 volts AC/DC, this heater has a nominal loading of 1 kW at 230/240 volts.

New Domestic Fuel Oil

The Mobil Oil Co., Ltd., announced recently the introduction of a new domestic fuel oil, 'Mobilheat VB.' This addition to the company's range of products is for use in the new small oil-burning domestic boilers which are now being produced by manufacturers throughout the country. As with other Mobil fuel oils, Mobilheat VB will be marketed through Charringtons and Associated Coal and Wharf Cos, Ltd.

New Cistern Chain

A new chain-pull for any high-level water cistern has just been introduced by Shires & Co. (London), Ltd., of Greenbottom Works, Guiseley, Yorks. It is called the Slim-Grip and it has a coloured acrylic handle in black, white, red, pink, blue and green. The chain section is heavily chromium-plated and manufactured to BS 1125.

TRADE NEWS

British Scaffolding in Spain

AS the result of an agreement, the complete range of scaffold fittings patented in Britain by Mills Scaffold Co., Ltd., of Trussley Works, Hammersmith-grove, London, W6, is to be manufactured and marketed in Spain. The local company concerned is Andamiajes Mills S.A. (Amillsa) of Hermosilla 19, Madrid, and the fittings will be manufactured under licence.

Companies Form Group

The directors of Highways Construction, Ltd., The Neuchatel Asphalte Co., Ltd., and Ragusa, Ltd., announce that arrangements are being made to place their principal interests in the United Kingdom under common management. The group will include the following operating subsidiaries:—Asphaltic Roadways, Ltd.; Croy Stone & Concrete Co., Ltd.; Chittenden & Simmons, Ltd.; John Hadfield & Sons, Ltd.; Highways Construction, Ltd.; a new Neuchatel Asphalte United Kingdom Co.; Ragusa Asphalte Paving Co., Ltd.; Ragusa Mastic, Ltd.; Roadstone (Edinburgh), Ltd.; South Eastern Engineering Co., Ltd.; Tarpaving and Tarmacadam, Ltd.; Terry Quarries, Ltd.; Wake & Co., Ltd. The head office will be at 'Neuchatel House,' Palace-st., London, SW1. The directors will be: William Cash, chairman; Eric Vigor, managing director; G. M. Fotheringham, B. W. Hadfield, John Hadfield, Oliver Poole.

Change of Name

Their continuing growth as manufacturers of industrial rubber products is reflected in the announcement by British Tyre & Rubber Co., Ltd., that, as from September 16, subject to confirmation by stockholders, its name is changed to BTR Industries, Ltd., a title designed to emphasise its relationship to industry in general as British thermoplastic and rubber manufacturers.

Truck Industry Combine

The announcement of an agreement has been made whereby Clark Equipment International C.A. has become an equal partner with the Austin Motor Company, Ltd., and Crompton Parkinson, Ltd., all parties sharing equally in I.T.D., Ltd., an established business organisation which has been marketing the 'Stacatruc' fork lift truck and 'Electricar' platform truck.

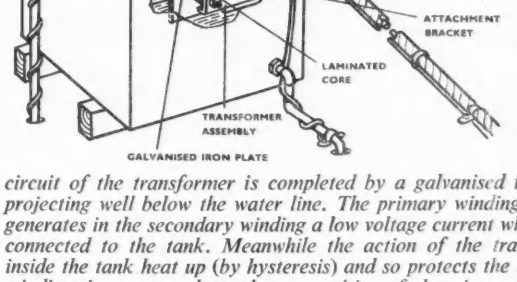
Exhibition News

The Sixth Factory Equipment Exhibition, to be held at Earls Court, London, next April 14-19, will have as its theme: 'Modern Factory Equipment—Britain Challenges the World.'

Price Lists

The new price list for the trade, recently issued by Hurseal, Ltd., 229, Regent-st., London, W1, contains details of new equipment produced for the coming season, together with new prices and sizes that came into force last month.

Dimplex, Ltd., Millbrook, Southampton, Hampshire, have just issued publication No. 306, a trade price list that covers the entire range of 'Dimplex' products giving the latest prices.



ELECTRIC ANTI-FREEZE.—The 'Peregrine' anti-frost system for water pipes and tanks is controlled by a thermostat so that the system is only switched on when the temperature drops to a little above freezing point. Manufactured by Power Frequency Heating, Ltd., Alexandra-rd., Hounslow, Middlesex, the system consists of a small step-down transformer fixed to the outside of the cold water tank just above the static water line; the main circuit of the transformer is completed by a galvanised iron plate fixed inside the tank projecting well below the water line. The primary winding, when connected to the mains, generates in the secondary winding a low voltage current which is used for heating the pipes connected to the tank. Meanwhile the action of the transformer makes the iron plate inside the tank heat up (by hysteresis) and so protects the tank from frost. The secondary winding is connected to the extremities of the pipes connected to the tank using the pipes themselves as conductors and heating elements. In addition an electro-magnetic induction effect can be produced by wrapping the secondary winding connector in a loose helix round the pipes; this induces hysteresis in the pipe walls, contributing to the heating

NEWS IN BRIEF

New Brickworks Planned

MR. R. L. BATLEY, divisional controller of the Midlands Electricity Authority, speaking at a meeting of the Midlands area of the Electricity Consultative Council, at the Meaford Power Station on September 16, said that experiments carried out by the Board with the use of pulverised fuel ash for brickmaking had been so successful that the Authority is now planning to build its own brickworks in the Division. The brick works would be built near the Hams Hall Power Station, Birmingham.

Change of Address

As from October 1, the address of the Lead Development Association and that of its affiliated section, formed to promote the activities of the now dissolved Lead Sheet and Pipe Council, will be 18, Adam-street, London, WC2 (tel.: Whitehall 4175).

Census of Production Report

Among the sections of the Report on the Census of Production for 1954, published on September 24, was 'Paint and Varnish' (Volume 2, Industry 1), price 1s. 9d. The section on 'Asbestos' (Volume 7, Industry A) was published on September 26, price 1s. 6d. Copies are available from HMSO.

Cement Depot, Manchester

The Cement Marketing Co., Ltd., and G. and T. Earle, Ltd., have opened a cement depot and offices at Shentonfield-road, Wythenshawe, Manchester, which displays some of the structural and decorative materials in the 'Blue Circle' range. The architect for the depot was Mr. R. Bull, AIAS, and the general contractors J. Gerrard and Son, Ltd.

Interest Rate Proviso

Stafford Rural Council decided on September 21 to ask the Housing Minister to approve a £75,520 housing tender provided that the loan for carrying out the work can be obtained at the rate of interest operating before the raising of the Bank rate. The tender is for 60 houses to be built at Gnosall.

Preference for Local Firms

Tamworth Rural Council is to ask the Housing Minister to allow preference to be given to local building contractors even if their tenders are slightly higher than those of their competitors. The decision was taken on September 21 after the council had approved a tender of a Birmingham firm for building five pairs of houses at Middleton at a cost of £16,791.

Management Course

A firm of management consultants who have worked extensively with the industry will shortly be repeating their one-week course on 'Management and Productivity in the Building Industry,' at their training centre at Slough, Bucks. The course is designed for senior and intermediate-level managers only. It will be held from November 25-29. One of the needs of the industry is that those in responsible positions should acquire an overall grasp of the management techniques which have been successfully applied to building operations. This is the aim of the course. The fee is 50 gns. Applications to Urwick, Orr and Partners, Ltd., 29, Hertford-street, W1.

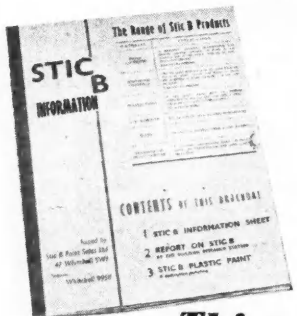
Fidor Lecture Programme

Following the successful series of winter lectures sponsored by FIDOR last year, a further programme covering the 1957-58 season has been planned, and the first lecture was given on September 17. Details of other lectures in the programme from the Fibre Building Board Development Organisation, Ltd., 47, Princes Gate, SW7.

COMPANY NEWS

Thomas De La Rue & Company, Ltd. announce that following the necessary consents having been obtained from the British and United States authorities Formica, Ltd., has started trading as from September 16. The new company will take over the manufacture and sale of all products including extrusions, formerly handled by the plastics division of Thomas De La Rue & Company, Ltd. Under an agreement between the American Cyanamid Co. and Thomas De La Rue & Co., Ltd., an interchange of technical information will take place in the field of laminated plastics over the next 25 years. The chairman of Formica, Ltd., will be Mr. A. G. Norman (managing director of Thomas De La Rue & Co., Ltd.) and the managing director will be Mr. G. G. Riddick. The remaining directors are Messrs. B. C. Westall (chairman of Thomas De La Rue & Co., Ltd.) and S. C. Moody and D. J. O'Conor, Jnr., for the American Cyanamid Co.

Eastwoods, Ltd., have recommended a final dividend of 10 per cent., less tax, on the ordinary stock of the company for the year ended March 31, making a total of 17½ per cent. (same).



This book tells you how to paint new concrete, new cement, etc.

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NAME.....

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OFFICIAL NOTIFICATION

Further Suspension of Import Duty on Cold-reduced Iron and Steel Sheet

UNDER the Import Duties (Exemptions) (No. 6) Order, 1957, the import duties on a wide range of iron and steel products are suspended until March 18, 1958, and under the No. 10 Order, 1957, the suspension of duty on almost all plates is prolonged until September 18, 1958.

After consultation with the Iron and Steel Board about the supply position, Her Majesty's Government have decided that the suspension of duty on most types of cold-reduced sheet of a value of less than £90 per ton should also be prolonged until September 18, 1958. A new Order, the Import Duties (Exemptions) (No. 12) Order, 1957 (SI No. 1625), has been made, and will come into operation on March 19, 1958. Copies of the Order may be obtained from HMSO, price 3d. (by post 5d.).

The question of further suspension of duty on other iron and steel products after March 18, 1958, is being examined; an announcement in respect of the duties on these other products will be made in due course.

DUMPER COMPETITION

A £350 dumper is offered as a prize in a competition by Thwaites Engineering Co., Ltd., of Leamington Spa, Warwickshire. The competition, for which an entry fee of 6d. is required, consists of placing in order of importance a number of characteristics or virtues of dumper trucks. The income from the 6d. entries will be presented to the British Empire Cancer Campaign, and Mr. Harmar Nicholls, JP, MP, Parliamentary Secretary to the Ministry of Works, will present the dumper to the winner on the Thwaites stand at the Building Exhibition in November. The judges will be J. C. Davies, of Tersons, Ltd.; N. D. Pirie, BSc (Eng), AMICE, AMIMechE, of Sir Robert McAlpine and Sons; N. A. Soper, BSc, of Tarmac, Ltd.; and C. E. G. Newby, AMITA, of A. Monk and Co., Ltd. Entry forms will be distributed by Thwaites dealers and the firm itself; next week one will be published in *The Builder*.

PERSONAL COLUMN

MR. PATRICK HALL, chairman of The British Reinforced Concrete Engineering Co., Ltd., leaves on September 29 on a visit to his company's Canadian subsidiary, BRC Weldmesh, Ltd., Vancouver.

MR. JASON SPENCER DAWES has been appointed chairman and managing director of Roberts Adlard & Co., Ltd., Bromley, Kent.

E. K. Cole, Ltd., announce the appointment of MR. J. C. WILCOX as Thermovent technical sales representative for the Birmingham Area. He will operate from 11, Brook-street, Birmingham (tel.: Central 2505).

The Nuralite Co., Ltd., have opened a new regional office at 63, Bardon-chambers, Infirmary-street, Leeds 1, under the management of MR. R. SHEARD.

Silvertown Rubber Co., Ltd., of Herga House, Vincent-square, SW1, announces the appointment of MR. J. WESTHEAD as works superintendent of its Silvertown factory.

MR. D. G. HEBBERD, manager of W. H. Smith & Son's Estate Department, is to retire at the end of September after 45 years with the firm. He is to be succeeded by MR. MAURICE GRAINGER.

OVERSEAS BUILDING

From Our Own Correspondents

AUSTRALIA.—The Queensland Minister for Mines and Development, Mr. Evans, has announced that legislation will be introduced in the State Parliament this session granting the Commonwealth Aluminium Corporation authority to develop the vast bauxite field in the north east of Queensland, on Cape York Peninsula. A township of 6,000 people and a deep sea port would follow the opening of the field, he said.

CANADA.—A £37m. thermal plant is to be built by the British Columbia Electric Company in the Vancouver area. With a capacity of 1,200,000 horsepower it will be one of the largest in the world. The boilers will be designed for the eventual use of atomic energy, when this becomes economic. Under present plans the new plant will be open in 1961.

CEYLON.—The Government are considering the setting up of a cement factory at Puttalam, on the west coast of Ceylon. They are also considering an application by the Kankesan Cement Works Corporation to install a second kiln originally planned for the present factory. . . . The Minister of Industries has invited a Czechoslovakian team of experts to Ceylon to investigate the possibility of setting up a second hydro-electric scheme in the country to provide the power for a string of industrial undertakings, the chief of which would be a fertiliser factory.

LIBYA.—The Minister of Communications has approved the scheme for modernising Libya's telecommunications, mentioned in a previous report. A total of $11m. (American) has since been mentioned as being needed to cover the cost of all the developments planned. These include a 50 kW broadcasting station to be erected in Tripoli to replace the two temporary 5 kW stations recently erected in Tripoli and Benghazi, and a Posts and Telecommunications Training School. None of this is likely to be completed before 1958, but tenders for the supply and installation of some of the equipment required are likely to be called for soon. In a statement to the Press the Libyan Under Secretary for Finance stated that $2,650,000 has already been set aside for broadcasting projects, and $2,750,000 for telecommunications. The entire project is being financed with US funds through the Libyan American Reconstruction Corporation, but the Directorate of Communications indicated that calls for international tenders would be issued in connection with the larger sections.

PAKISTAN.—The New Zealand Government have agreed to contribute £300,000 towards the establishment of a sugar mill at Dewanganj to be set up by the Pakistan Industrial Development Corporation. . . . The four oil distributing companies operating in Pakistan have agreed to submit a joint proposal regarding the establishment of an oil refinery in the country. Survey teams should arrive shortly to offer advice on the location of the installation and to study marine facilities. The venture is to be handled by a company to be registered in Pakistan. . . . It has been announced that the ICA has agreed to extend to Pakistan £10m. towards the foreign exchange costs of one or more fertiliser plants to utilise natural gas, each to have an annual capacity of some 117,000 tons of urea or its equivalent. Pakistan is not compelled under the terms of the agreement to accept the bid of any American company to erect and/or operate the plant(s). On his return from the USA recently the Pakistan Finance Minister stated that two possibilities are being considered by his Government: (a) the establishment of two fertiliser factories financed by private American and Pakistan capital; and (b) the supply on long-term credit by 'an American party' of machinery for a fertiliser factory.

PANAMA.—The Panama Refining Co. are proceeding with site preparations at Las Minas Bay where they plan to construct an oil refinery and associated storage tank area, residential area and wharves. Over the past three months the Panama Refining and Petrochemical Co., which had also signed a contract with the Panamanian Government to construct a refinery, continued discussions with the Government over the selection of a site. The Government refused permission for them to build in the Colon Free Zone and finally the company agreed to a site at Portobelo. This decision may lead to harbour, road and housing developments at Portobelo. . . . In conjunction with the United States International Co-operation Administration the Panamanian Government have signed a contract with the Harza International Engineering Co. of Chicago to investigate the hydro-electric resources of the Republic. The company is to submit a report by June, 1958, outlining Panama's electric power requirements for the next 20 years and indicating the best sources of supply. . . . A number of new factories are under consideration. Industria Panama—Boston SA plans a factory for the production of edible oils and fats, Ventbloc de Panama SA desires a plant to manufacture doors and windows, other factories planned are for processing coconut oil, match manufacturing, and metal processing. . . . Inter-American Industries Ltd. are negotiating with the American Federation of State, County and Municipal Employees for the building in their projected plant in the Colon Free Zone of 1,000 houses for Panamanian workers employed in the Canal Zone. This firm also hopes to expand the project to build low cost housing for other workers in Panama. . . . The Seventh Pan-American Highway Congress has met in Panama to discuss the building of a road to link the Panama Canal and the Colombian highway system—a gap of over 300 miles through the jungles of Darien and northern Colombia. The Export-Import Bank has granted Panama a loan of $13m. to complete the remaining gaps in the Panamanian section of the Inter-American highway which is to link the Canal with the USA.

VENEZUELA.—In the new township of Puerto Ordaz plans are well advanced for a Government site for the housing of a further 15,000 people. . . It has been suggested that once the railway from El Trueno to Ciudad Bolivar is built plans will be made for another railway from Ciudad Bolivar with a bridge across the Orinoco to Puerto La Cruz. . . . The south-east of Venezuela is to remain decentralised. This point is agreed by experts in the country who insist that the projected international airport be built mid-way between Ciudad Bolivar and Puerto Ordaz.

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Philippines Flour Mill Contract

A contract valued at nearly $1m. has been placed with Thomas Robinson and Son Ltd., of Rochdale, by Republic Flourmills Incorporated, a newly-formed company in the Philippines. Achieved in the face of world-wide competition, the contract covers the design and equipment of the first flour-mill to be erected in the Philippines. When completed it will be the most modern plant of its type in the world, it is claimed. Sited on the Pasig River, the mill will be capable of handling some 240 tons of wheat in 24 hours.

CONTRACTS OPEN

***Australia.**—Tenders invited for the supply and erection of a complete gas works. The contract will be in various sections to cover the whole of the material and labour required for work. Bids should be sent to The Town Clerk, Municipality of Greater Cessnock, New South Wales, by December 18. A copy of the tender documents will be available for loan to UK firms in order of receipt of applications. Ref. ESB/22441/57 (tel.: Chancery 4411, ext. 738 or 771).

***Australia.**—It has been announced that Stephenson & Turner, Architects, 374, Little Collins-st., Melbourne, have invited tenders for the construction of the Main Ward Block and Outpatients' Department of the Royal Children's Hospital. Tenders close at the architects' offices on October 15. Ref. ESB/22464/57 (tel.: Chancery 4411, ext. 738 or 771).

* From the Board of Trade Special Register Information Service. The telephone number and extension at the end of the paragraphs relate to the department of the Export Service Branch, Lacon House, Theobalds-road, WC1, where further information can be obtained.

The SCOTTISH BUILDER

Edinburgh Plan Approved

THE Edinburgh development plan, prepared on the assumption that the population of the city will have risen to 500,000 by 1977, has been approved by the Secretary of State for Scotland. The aim of the plan is to control the natural growth expected in the next 20 years, anticipated at about 5 per cent. above the present population. Its main object is to guard existing amenities and open spaces, create new amenities whenever possible, prevent repetition of past mistakes, provide clearly defined areas for housing, industry, education, cultural development, a green belt, and major road improvements.

A total of 142 acres has been allocated for cultural, university and public building areas; 842 acres of undeveloped land set aside for industry, and sites provided for 17 new primary schools, seven new secondary schools, and 42 nursery schools. Provision is also made for the building of two bus stations at Morrison-street and St. Leonards within five years and for another in Leith Walk to serve both as a bus station and as a helicopter station, to be built between 1962 and 1977.

There will be inner ring roads to by-pass the congested city centre and an outer ring road to by-pass the city. One project is a relief tunnel road cut through Calton Hill to avoid traffic delays in the city centre.

Presentation

MR. JOHN NEEDHAM, new Professor of Architecture at Sheffield University, was honoured on September 19 by colleagues, former students and friends in Dundee, where since 1938 he has been head of the School of Architecture, Dundee College of Art. He was presented with a gold watch. Mrs. Needham received a travelling clock. Mr. T. H. Thomas, speaking on behalf of practising architects in Dundee, said Mr. Needham was a brilliant teacher, known among architects throughout the length and breadth of Britain.

RIAS Medal Award

THE Council of the Royal Incorporation of Architects in Scotland has decided to consider awarding a medal for a building of outstanding merit in Scotland completed during the period from January 1, 1950—December 31, 1956. The last RIBA Bronze Medal for Scotland was awarded in 1950.

The jury is as follows: Sir William O. Hutchison, PRSA, Edinburgh; T. H. Thomas, FRIBA, Dundee; T. S. Cordiner, FRIBA, Glasgow; A. Esmé Gordon, FRIBA, Edinburgh; A. McIntyre, FRIBA, Durham (appointed by RIBA); J. Noble, of Ardkinglas, Argyll.

NEW BUILDINGS

Ayr CC.—4,180 yd. 8 in. spun iron pipes from Hillhead, Mauchline to Hurlford. Contract No. 2, Crosshands to Crossroads. Applications to County E., County-bldgs.

Edinburgh.—Tenders invited for work on first stage of Firrhill sec. sch. Est. cost £320,000. A: R. Matthew & Johnson-Marshall (F), 31, Regent-terr., Edinburgh 7. Applications to City A, City Chambers, High-st., Edinburgh 1, by October 2.

Fife CC.—Permission received from Kirkcaldy Dean of Guild Court to erect St. Andrews RC high sch. at Overton-rd., Kirkcaldy.

Glasgow.—Tenders invited for several works in connection with cleansing depot at Pettigrew-st., Shettleston. Applications to Architectural & Planning Dept., 20, Trongate, C1. Tenders by October 14, to W. Kerr, Town C.

Hamilton.—Plans approved for Hillhouse Parish Church at Clarkswell-rd. Est. cost £17,000.

Lanark.—Tenders invited for all trades in connection with extension to Plains prim. sch. Applications to I. V. Paterson, County C, Lanarkshire-hse., 191, Ingram-st., Glasgow, C1.

North of Scotland Hydro-Electric Board.—Control building, access road, and other works for sub-station at Port Ann, nr. Ardrishaig, Argyllshire. Applications to Messrs. Strain & Robertson, engrs., 5, Park-circus, Glasgow, C3. Dep. £2 2s.

SCOTTISH BUILDING TRADE WAGES

FOLLOWING are rates of wages authorised by the Scottish National Joint Council as from May 27, 1957. They apply to the whole of Scotland, including the islands of Orkney, Shetland, etc.

Grade A: Craftsmen 4s. 6d.; Labourers 3s. 11½d.

For apprentices, the rates are:

Year.	Percentage of Craftsman's rate.	For week of 44 hours
		s. d.
1st	25	49 6
2nd	33⅓	66 0
3rd	50	99 0
4th	66⅔	132 0
5th	75	148 6

For female labour, the rates are:

	s. d.
Operatives on craft operations (at end of probationary period)	3 11½
Operatives on labouring operations (at end of probationary period)	3 5½

The Builder FUTURE CONSTRUCTION

Full details of Public Appointments open will be found in the Advertisement pages of this and previous issues.

CONTRACTS OPEN

For some contracts still open but not included in this list see previous issues. Those with an asterisk are advertised in this number. The dates at the heads of paragraphs are those for the submission of tenders: a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained.

BUILDING

SEPTEMBER 30.

***†Isle of Man.**—Erection of Multi-Purpose Ward Block and Twin Operating Theatre Unit, Westmoreland-rd., Douglas. (Firm price tender.) E. C. Kneale, Secretary, Hospital Management Committee, Noble's Isle of Man Hospital, Douglas.

†Tottenham BC.—54 nine-storey flats and nine two-storey dwellings at 672/4, High-rd. and on land at rear. Boro' E. Dep. £2 2s.

OCTOBER 3.

***†Swansea CB.**—60 flats at Terrace-rd. Boro' A. Dep. £2.

OCTOBER 4.

***†Maidstone BC.**—25 houses, two bungalows. BS. Tenders by November 2.

OCTOBER 5.

***†Essex CC.**—New magistrates' Court House, Harlow. County A, Chelmsford.

***†Essex CC.**—Kitchen, Upshire county prim. sch., Waltham Abbey. County A, Chelmsford.

***Essex CC.**—Alterations and additions at 73/75, Springfield-rd. County A.

OCTOBER 7.

***Durham CC.**—Additions Catchgate schools. C.

***†Gravesend BC.**—72 maisonettes and 32 flats at Park-place. BE&S, 6, Woodville-terr. Dep. £2 2s. Tenders by November 18.

***†Hampshire CC.**—Assembly hall, dining-room, etc., at Farnborough Technical Coll. County A. Dep. £2 2s.

OCTOBER 8.

***Rugby BC.**—Bathroom improvements to 34 houses. BS.

OCTOBER 9.

***†Durham CC.**—Improvements, etc., to eight schools. County A, Durham.

OCTOBER 14.

***Hoddersdon UDC.**—62 concrete garages. E&S.

***Hornchurch UDC.**—85 lock-up garages at various estates. S, Council Offices. Dep. £2 2s.

OCTOBER 15.

Marlow UDC.—16 flats and two shops at Dean-st. (Fixed price tender.) Henry Cooper & Sons, Ccl's. QS, 64, London-rd., Reading. Dep. £2 2s.

OCTOBER 17.

***Barnes BC.**—Fixed price tenders for the erection of 32 flats together with small outbuildings. BE&S.

OCTOBER 18.

***†Bromley BC.**—15 houses. BE.

OCTOBER 22.

***Ilford Boro.**—Alterations Loxford sec. boys' sch. BE. Dep. £2 2s.

OCTOBER 24.

***Berkshire and Reading Joint Fire Authority.**—Erection of Fire Station at Eagles-cl., Ormond-rd., Wantage. County A. Dep. £2 2s.

***Croydon CB.**—18 garages Coldharbour-rd. BE.

***Ripley UDC.**—Three shops and two flats, Elms estate. H. Hillier, S. Dep. £2 2s.

OCTOBER 25.

***Leatherhead UDC.**—Bus shelter and convenience. S. Dep. £2.

OCTOBER 30.

***Walthamstow BC.**—17 bungalows and 13 flats at Priory-ct., Countess-rd. Boro' A, E&S. Dep. £2 2s.

PLUMBING IN BUILDING
By Sydney Webster, A.R.I.B.A.
Recent substantial changes in materials and techniques make this new book invaluable. The author is Lecturer in Building Construction at the L.C.C. School of Building, Brixton, and a practising architect. Specialised fittings, prefabrication and scientific installation methods receive particular attention. 25/- (Postage 1s. 2d.)

DRAINAGE AND SANITATION
By E. H. Blake and W. R. Jenkins
New sections on factory drainage, ventilation and warming, on district heating and on solid fuel appliances, have been added to the new, eleventh edition of "Blake." Also the whole work has been revised, reset and re-illustrated. Over 500 pp.
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NOVEMBER 1.

***Ealing BC.**—24 flats Northolt and 122 flats and maisonettes, Northolt Park estate. BS. Dep. £2.

NOVEMBER 4.

***Bucks CC.**—Conversion Wing Lodge to old people's home. County A, Aylesbury.

NOVEMBER 8.

***Hampshire CC.**—Erection of Bramley new jun. and infants' sch. and Basingstoke South Ham infants' sch. (timber construction). County A. Dep. £2 2s. each.

NOVEMBER 13.

***Hants. CC.**—New boys' sec. sch., Basingstoke. County A, Winchester.

NOVEMBER 16.

Barnsley CBC.—Fire Service Headquarters, comprising three-storey steel-framed block with appliance room wing attached, workshop block, 60 ft. high drill tower, underground water storage tanks, earth, road works and landscaping. Boro' E. Dep. £2 2s.

MUNICIPAL AND CIVIL ENGINEERING WORKS, ETC.

SEPTEMBER 30.

†Lancashire River Bd. and Crossens Internal Drainage Bd.—Large pumping station, dredging of rivers, alterations to bridges, etc., value £500,000. C to Bd. Dep. £10 10s.

OCTOBER 1.

South Cardiganshire Water Bd.—2,500 yd. of 3 in. and 2,300 yd. of 2 in. dia. asbestos-cement pipes in parishes of Bettws Evan and Llangoedmore (fixed price tender). Bd's E. Dep. £3 3s.

OCTOBER 12.

Warwick BC.—900 lin. yd. of 36 in. dia. and 200 lin. yd. of 30 in. dia. concrete pipe sewer with manholes, etc., from Percy estate to River Avon, including crossing of Grand Union Canal. Boro' E&S. Dep. £2 2s.

OCTOBER 14.

Brixworth RDC.—3,400 yd. of 9 in. and 6 in. dia. concrete and glazed stoneware sewers, with manholes and house connections, 770 yd. of 4 in. dia. CI pumping main, pumping station and sewage disposal works for parishes of Chapel Brampton and Broughton Crossing, Northants. Pick, Everard, Keay & Gimson, engrs., 6, Millstone-la., Leicester. Dep. £2 2s.

Brixworth RDC.—4,500 yd. of 12 in., 9 in. and 6 in. dia. concrete and glazed stoneware sewers, with manholes and house connections and sewage disposal works for parish of Spratton, Northants. Pick, Everard, Keay & Gimson, engrs., 6, Millstone-la., Leicester. Dep. £2 2s.

OCTOBER 21.

Abingdon RDC.—6,000 lin. yd. of small-diameter sewers, two sewage pumping stations, rising mains, extensions to sewage disposal works, etc.. Howard Humphreys & Sons, constg. engrs., Victoria Station-hse., Victoria-st., SW1. Dep. £3 3s.

OCTOBER 24.

Gipping RDC.—1,060 lin. yd. of 6 in. and 9 in. dia. sewers with manholes and connections to sewers at Needham Market, nr. Ipswich. Sandford, Fawcett & Ptnrs., Ccl's. constg. engrs., 53, Victoria-st., SW1. Dep. £5 5s.

OCTOBER 28.

West Kent Main Sewerage Bd.—Construction in r.c. on piled foundations, of comminutor channels, grit channels, four sedimentation tanks each of one million galls. capacity, pumphouses, etc., at sewage purification works, Long Reach, Dartford. Sec. to Bd. Dep. £10 10s.

NOVEMBER 4.

Warwick RDC.—1¾ miles of 6 in. salt glazed ware sewers with precast concrete manholes and ½ mile of asbestos-cement sewers, sewage disposal works, pumping station and appurtenant pipeworks and chambers at Leek Wootton. J. D. & D. M. Watson, Ccl's. constg. engrs., 18, Queen Anne's-gate, SW1. Dep. £10 10s.

NOVEMBER 8.

Llandeilo RDC.—42,650 yd. of 8 in. to 3 in. dia. steel, CI and asbestos-cement water mains, special valves, etc. Sandford, Fawcett & Ptnrs., Ccl's. constg. engrs., 58, Victoria-st., SW1. Dep. £5 5s.

NOVEMBER 11.

Tees Valley Water Bd.—Steel girder pipe bridge, 210 ft. span on piled r.c. abutments, crossing River Tees at Eaglescliffe, including driving of steel box piles and installation of twin 33 in. dia. steel pipes. (Fixed price tender.) T. S. R. Winter, MICE, AMIWE, E&Gen. mgr. Dep. £5 5s.

DECEMBER 10.

Herefordshire CC.—Seven miles of dual carriageways, one prestressed concrete bridge, 350 ft. long, over River Wye, 12 other bridges, three single level and one flyover intersection on Ross by-pass and Ross-Tewkesbury motorway. County S. Dep. £50.

GENERAL BUILDING WORK (LONDON)

Bethnal Green.—FLATS.—The Housing Com. has approved revised proposals for two blocks (B8 and B9) of eight three-room flats, the sites for which will shortly be available, at Avebury estate, estimated to cost £45,833. The appointed architects for the scheme are T. P. Bennett & Sons (F/F), 43, Bloomsbury-sq., WC1.

Bethnal Green.—FLATS, MAISONETTES AND HOUSES.—The LCC Housing Com. has approved proposals submitted by the appointed architects, Howes & Jackman (F/F), 1, Verulam-bldgs., Gray's Inn, WC1, for the development of a site of about 3.25 acres adjoining Teesdale estate, by one eleven-storey, one six-storey and two four-storey blocks of flats and maisonettes, one two-storey block of flats for old people and a terrace of five houses comprising in all 129 dwellings. The eleven-storey block and the six-storey block will be served by lifts. A car park, 20 garages, 62 tenants' stores, and two playgrounds will also be provided. The estimated cost of development, including architectural and incidental expenses, is £374,300.

Camberwell.—SITE ACQUISITION.—The LCC Housing Com. proposes to acquire by compulsory purchase an area and adjoining lands, totalling 1.15 acres and comprising 30 houses at Tyne-terr. and Consort-rd. It is also proposed to acquire 6.64 acres of additional lands for development in conjunction with adjoining lands belonging to the Council. It is estimated that 315 dwellings can be built on the lands.

Camberwell.—SITE ACQUISITION.—The LCC Housing Com. proposes to acquire by agreement the sites of 159-167 (odd), Peckham Park-rd., on which it is estimated that 11 dwellings can be erected.

Camberwell. — SCHOOL ALTERATIONS.—The LCC Education Com. has approved a scheme for the adaptation of Rye House, Peckham-rd., and Sumner House, Sumner-ave., to the purposes of a new county secondary school for boys. The estimated cost of the work is £12,585. The architects for the scheme are J. M. Austin-Smith & Ptnrs. (A/A).

Chelsea. — SCHOOL EXTENSIONS. — The governors of St. Thomas More RC secondary school propose to proceed with the second stage of a scheme estimated to cost £42,011 to provide additional accommodation by adaptation of rooms in the adjoining convent.

Friern Barnet.—MAISONETTES, HOUSES AND GARAGES.—The UDC Planning Com. recommends approval, subject to detailed plans, of a revised proposal to demolish the existing house and to construct a new access road, two blocks of four maisonettes, 10 semi-detached houses and 14 garages at 'Thatcham,' 1478, High-rd., N20, for Capital Homes, Ltd. (The previous outline application was refused by the Area Planning Com. on the grounds of layout and density).

Friern Barnet.—FLATS, MAISONETTES AND GARAGES.—TP and By-law approval has been given to the following proposals: Demolition of existing property and erection of three two-storey blocks of four one-bedroom flats, with provision for garages at 5, Stanford-rd., N11, for McManus Childs, Ltd.; demolition of existing property and erection of two two-storey blocks of four maisonettes and eight garags at 100, Torrington-park, N12, for F. J. Mortimer & Sons, Ltd.; 12 flats, 20 maisonettes and 20 garages at Woodhouse-rd., junction with Woodleigh-ave, N12, for Davis Estates, Ltd.

Harrow.—CHANGING UNITS.—The LCC Education Com. has approved plans for two changing units, a store, a groundsman's house and other works, estimated in all to cost £94,735, at Prince Edward playing field.

Heston and Isleworth.—REDEVELOPMENT.—The TP Com. recommends approval of a scheme for the redevelopment of the area bounded by South-st., Worple-rd., Magdala-rd. and Richmond-rd. by 12 flats suitable for aged persons; 6 flats suitable for childless couples; 14 three-bedroomed houses; 16 two-bedroomed flats; 10 shops and 12 garages. The Boro' E&S is T. A. Lawton, MIMunE, ARICS, (L).

Heston and Isleworth.—OFFICES AND FLATS.—The Housing Com. recommends approval of a proposal to grant to Rodwell Properties, Ltd., 9, Hertford-st., W1, a 99 years' lease of the Lampton island site, Great West-rd., for the erection of a five-storey office block with adjacent two- and three-storey flats to accommodate 50 families.

Islington.—DWELLINGS.—The MBC proposes to erect some dwellings on the site of the former Highbury Hill Baptist Church, and has appointed Messrs. E. C. P. Monson (A/A) as architects, and Messrs. Oswald E. Parratt, FRICS, as quantity surveyors for the scheme.

Islington.—The LCC Housing Com. has approved proposals for developing three small sites between Caledonian-rd. and Bemerton-st. to the north of Copenhagen-st., N1. The Bemerton-st. areas and site are about 1.5 acres, the Bingfield-st. area is just over two acres and the Luard-st. area is about 2.4 acres in extent. A ten-storey block will be erected on the Bemerton-st. site and a similar block, together with two four-storey blocks, will be provided on the Bingfield-st. site. The lay-out for the Luard-st. site comprises a four-storey block as well as a doctor's house and surgery. The housing accommodation will comprise 229 dwellings in all and there will also be 115 tenants' stores, 18 garages and a playground, and on each of the three sites there will be a parking space. Each ten-storey block will include two lifts and will be provided with electric floor-heating. The estimated cost of development is £672,000.

St. Marylebone.—FLATS AND GARAGE.—Planning permission has been received from the LCC for a block of luxury flats at 40/41, Wimpole-st. and 19/21, Wimpole-mews, W1, i.e., 14 flats at Wimpole-st. on ground and six floors, with basement garage; and four flats at Wimpole-mews. The architects for the scheme are Douglas Stephen & Ptnrs. (A/A), and the quantity surveyors are Lionel Simmons & Ptnrs., both of 30b, Wimpole-st., W1.

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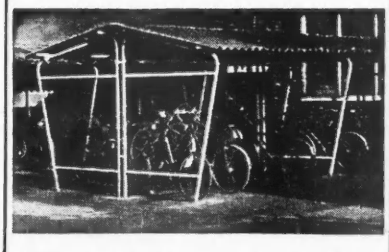

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St. Marylebone.—SCHOOL.—The LCC Education Com. has approved a scheme for the rebuilding of Bellfield county sec. sch. The ultimate site will be over three acres in extent, but the first stage site is bounded by Penfold-st., Bell-st., Lisson-st. and Ashmill-st. The buildings will consist of a main three-storey block and a separate block containing the assembly hall and two gymnasia, and linked to the main building by a covered way. The estimated cost of the scheme is £333,382. The architects are Leonard Manasseh & Ptnrs. (A/A), 39, Bedford-st., Strand, WC2.

Shoreditch. — PLANNING APPROVAL. — The MBC has received TP approval from the LCC for the development of the Nicholas-st. site and the sites of 16-32 (even), Weymouth-terr., 37 and 39, Dunloe-st. and 7-25 (odd), Haggerston-rd. for residential purposes. The Boro' E&S and architect is J. L. Sharratt, OBE, AMICE, MTPI.

Stoke Newington. — FLATS. — The Housing Com. recommends approval of a proposal to build a four-storey block of six bed-sitting room flats, eight one-bedroom flats and four two-bedroom flats on the site of 307, Green Lanes as an extension of the Portland Rise estate, and the appointment of Howes & Jackman (F/F), 1, Verulam-bldgs., Gray's Inn, WC1, as architects, and of E. C. Harris & Ptnrs., 7-12, Tavistock-sq., WC1, as quantity surveyors for the scheme.

Walthamstow.—FLATS AND GARAGES.—The Reconstruction and Housing Com. has approved an amended scheme for the development of the Knebworth-ave., Chingford-rd. and Cecil-rd. site by 28 two-bedroom flats, and 20 one-bedroom flats in two four-storey and one three-storey blocks, and 76 garages. The Boro' A, E&S, is F. G. Southgate (A), MIMunE, AMTPI.

Wandsworth.—SCHOOL.—The LCC Education Com. proposes to erect a school for 180 delicate children on a site of 2¼ acres at St. Margaret's-cres., Putney Park-la., SW15. The estimated cost is £76,514. The architects for the scheme are James Cubitt & Ptnrs. (F/A), 25, Gloucester-pl., W1.

Westminster.—MODERNISATION OF DWELLINGS.—The LCC Housing Com. has approved a scheme for the modernisation of Wilkie-bldgs., Millbank estate, estimated to cost £44,050.

Westminster.—OFFICES, FLATS AND GARAGE.—Planning permission has been received from the LCC for an office building at 9 to 11, Richmond-bldgs., Dean-st., W1, on ground, first, second and third floors, with two flats on the fourth floor and a basement garage. The architects for the scheme are Douglas Stephen & Ptnrs. (A/A), and the quantity surveyors are Lionel Simmons & Ptnrs., both of 30b, Wimpole-st., W1.

TENDERS

* Denotes *accepted*.
† Denotes *provisionally accepted*.
‡ Denotes *recommended for acceptance*.
§ Denotes *accepted subject to modification*.
¶ Denotes *accepted by H.M. Government Departments*.

Billingham-on-Tees. — Multi-storey offices, 300 ft. long, 65 ft. wide and 120 ft. high, for Imperial Chemical Industries, Ltd. Plans by firm's own A in association with Professor W. B. Edwards (F), 5, Claremont-bldgs., Newcastle-on-Tyne. *John Laing & Sons, Dalston-rd., Carlisle.

Bilston.—24 flats and 22 houses at Dudley-st. site, for TC. *Gregory Housing, Ltd., Worthing, Sussex. £61,434.

Birkenhead.—12 houses on site of RF sch., Old Chester-rd., for TC. *H. Bevan (Builders), Ltd., 30, Desmond-st., Liverpool. £21,664.

Blackpool.—Extensions to La Sagesse Hospital, Stoney Hill-av., for Trustees of Convent of Wisdom. *Wm. Eaves & Co., Ltd., Marton, Blackpool.

Bolton.—Alterations to Forge Tavern, Bridgeman-st., for Magee Marshall & Co., Ltd. *Robert Paiton & Son, Ltd., Bradford-st., Haulgh, Bolton.—Commercial garage and petrol-filling station at Manchester-rd., for Levers (Garages), Ltd. *John Brown & Son, Ltd., Park-st., Bolton.

Bradford.—234 dwellings at Tong estate, for TC. *John Laing & Son, Ltd., Dalston-rd., Carlisle.

Brighton.—Eight bungalows for old people at rear of Devonia and Herons Court, London-rd., for BC.

Rice & Son, Ltd. £16,097
V. & L. Cruttenden, Ltd. £15,147
A. C. Jenkins, Ltd. £14,817
Jeffery & Sons (Hove), Ltd. £14,774
*Edward Cox & Co., Ltd., 12, Richardson-rd., Hove, 3 .. .. £12,547

Chester.—Preliminary and completion works to roads on remainder of Newton Hall estate for City C. ‡W. E. Parsons & Co., Ltd., £60,537.

Chesterfield.—52 dwellings at Heath and 41 dwellings at Tupton for RDC. E, Rural Council House, Saltergate, Chesterfield. 52 dwellings, Heath. *W. Wright & Sons (Sutton-in-Ashfield), Ltd., Redcliffe-st., Sutton-in-Ashfield, Notts., £67,841. 41 dwellings Tupton. *W. Redmile & Sons, Ltd., Parkfield Works, Alderson-rd., Sheffield 2, £61,500.

Clackmannan.—16 houses at Cattlemarket, for CC. County A: W. H. Henry (L): *Mason and brickwork*: *Alexander Todd, 71, Deerpark, Sauchie, by Alloa. *Carpenter and joiner work*: *Robert Keir, 150, High-st., Tillicoultry. *Glazier work*: *George G. Kirk, Ltd., 45, Upper Craigs, Stirling. *Roof tiler and roughcast work*: *Peter Kelly & Sons, Ltd., 33, Brunswick-rd., Edinburgh, 7. *Plumber work*: *A. D. Mitchell & Sons (Plumbers), Ltd., New-row, Perth. *Plaster work*: *John Wallace & Co., 62, L. Bridge-st., Stirling. *Electrical work*: *A. M. Todd, Stirling-st., Tillicoultry.

Coventry.—New hostel at The Butts, for YWCA. *G. & A. G. Gale, Bodmin-rd., Coventry.

Dawley.—244 dwellings and 38 garages at Langley Farm estate, for UDC. *Wates, Ltd., London. £369,778.

Dewsbury.—419 dwellings, 4 shops, roads and sewers at Valley-rd. site, for BC. *Geo. Wimpey & Co., Ltd., London. £602,466 and £75,429.—Two classroom blocks at Wheelwright grammar sch. for boys, for BC. *Wm. Airey & Sons (Leeds), Ltd., Eldon-hse., Leeds.

Exeter.—103 dwellings at Dunsford-rd. site for City C. City A: H. B. Rowe (F), AMI StructE., *Woodman & Son, Ltd., 4, Bartholomew-st. East, Exeter, £142,244.

Islington.—Block A, Naish Court, comprising 22 dwellings and new licensed premises, for BC. A: Messrs. E. C. P. Monson (A/A), 120, Moorgate, EC2. QS: Messrs. Oswald E. Parratt, FRICS. ‡Herbert Richardson & Sons, Ltd. £63,435 (negotiated tender).

Jarrow.—Steelwork for proposed additions to Jarrow grammar sch., for Durham CC. County A: G. R. Clayton (F), South-st., Durham. *Wright, Anderson & Co., Ltd., Gateshead. £17,190.

Lambeth.—24 flats, 6 garages and 16 perambulator stores at Acre-la. for MBC. ‡Thomas & Edge, Ltd., £60,760.

Lindsey.—Sec. mod. sch. at Westmoor-rd., Brigg, for CC. County A: A. R. Clark (A), AMPTI. *J. W. Hill, East Common la., Scunthorpe, £101,879.

Liverpool.—Extensions to YMCA building at Mount Pleasant. *John Williams (Liverpool, Ltd., 70, Collingwood-st., Liverpool.

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London (Air Ministry).—New works contracts to value of £500 or over for week ended September 20:—*Painting work:* Quedgeley, Glos., J. L. Cheeseman & Co., Ltd., 76, Beech Croft-gardens, Wembley Park, Middx.; Weeton, Lancs., M. A. Appleton (Contractors), Ltd., 22, Bilston-st., Wolverhampton, Staffs. *Heating and ventilating:* North Coates, Lincs., W. H. Gascoigne & Co., Ltd., 15, Brackenbury-rd., Hammersmith, W6. *Artificers' work:* Hendon, Middx., Haymills (Contractors), Ltd., Empire-hse., Hanger Green, W5; Bishops Court, Co. Down, Hugh J. O'Boyle, Ltd., "The Green," Irish-st., Down Patrick, Co. Down; Ternhill, Shropshire, Lewis & Watters, Ltd., Lime-ave., Lillington, Leamington Spa, Warwickshire; Biggin Hill, Kent, Kerridge (Cambridge), Ltd., Sturton-st., Cambridge. *Civil engineering:* Marham, Norfolk, Walter, Lawrence & Son, Ltd., Ventnor-hse., London-st., Swaffham, Norfolk.

London (British Railways).—Recent contracts placed by North-Eastern Region:—*Thornaby motive power depot*: Heating and hot water services, boiler house plant, W. Richardson & Co., Ltd., Darlington; heating and hot water services, administration block, Brightside Heating and Engineering Co., Ltd., Newcastle; heating and hot water services, main stores block, etc., H. Morfitt & Sons, Ltd., Leeds; stores hoisting facilities, Paterson Hughes Eng. Co., Ltd., London.

London (British Railways).—Contracts placed by Eastern Region:—Henry Lees & Co., Ltd., Motherwell, for repairs to coaling plant at Norwich.—The Cleveland Bridge & Engineering Co., Ltd., P.O. Box No. 27, Darlington, Co., Durham, for reconstruction of superstructure of underline bridges Nos. 1942, 1945 and 1947 between Bruce-gr. and White Hart-la. stations, and of underline bridge No. 1950 between White Hart-la. and Seven Sisters stations.—James Kilpatrick & Son, Ltd., 21, Tothill-st., SW1, for supply, delivery and erection of electrical installation in engine repair shop at diesel maintenance depot, Stratford.—W. & C. French, Ltd., Buckhurst Hill, Essex, for reconstruction of superstructure of overbridge No. 18 between Liverpool-st. and Bethnal Green stations, and overbridges Nos. 1936, 1964 and 1965 between Seven Sisters and Bush Hill Park stations.

London CC.—New county sec. sch. at Beechcroft-rd., Wandsworth:—

The Unit Construction Co., Ltd.	£315,421
Halse & Sons, Ltd.	£311,154
Stewart and Partners, Ltd.	£303,985
M. J. Gleeson (Contractors), Ltd. ..	£303,930
F. & H. F. Higgs, Ltd.	£303,666
W. J. Simms, Sons and Cooke, Ltd.	£299,869
Prestige & Co., Ltd.	£297,981
Thomas and Edge, Ltd.	£293,732
*S. G. and A. Agombar, Beckenham	£290,838

Architect's comparable estimate was £306,660.

London CC.—Three new county prim. schools at Roehampton No. 3 site, Wandsworth, Lillie-rd., Fulham, and Bassant-rd., Woolwich, respectively. Tenders on basis A allow for fluctuation in rates of wages and costs of materials and on basis B in rates of wages only. Firms were also asked to tender alternative prices for specification for school at Bassant-rd. of either stoneware or pitch-fibre drain-pipes:—

	Basis	*Stoneware drains* £	*Pitch-fibre drains* £
W. H. Gaze & Sons, Ltd.	A	226,990	226,808
C. Miskin & Sons, Ltd., St. Albans ..	A	221,081	220,953
S. G. & A. Agombar	A	220,742	220,420
F. R. Hipperson & Son, Ltd.	A	212,347	212,322
A. A. Stuart & Sons (Glasgow), Ltd. ..	A	210,156	210,136
W. J. Simms Sons & Cooke, Ltd. ..	A	209,940	209,682
Speirs, Ltd.	A	209,938	209,751
	B	211,738	211,551
M. J. Gleeson (Contractors), Ltd. ..	A	207,214	206,835
Gee, Walker & Slater, Ltd.	B	204,934	204,898
*Thomas & Edge, Ltd., Woolwich (for stoneware drains) ..	A	192,909	192,724

Architect's comparable estimate on basis A is £207,861.

London CC.—Additional classrooms at Hallfield county prim. sch., Paddington South. Tenders on basis A would allow for fluctuations in rates of wages and costs of materials and on basis B in rates of wages only. A: Drake & Lasdun (A/F):—

	Basis	£
Harry Neal, Ltd.	A	27,482
A. T. Chown & Co., Ltd ..	A	26,894
	B	27,300
Chas. Berger & Son, Ltd. ..	A	26,609
Walker (Tooting), Ltd. ..	A	26,055
Howard & Co.	A	24,985
G. Ward (Ealing), Ltd. ..	B	24,958
Ward & Patterson, Ltd. ..	A	24,827
§Hussey Bros. (Builders), Ltd., Paddington	A	23,800

Architect's comparable estimate on basis A is £24,688. It is proposed to omit items estimated to cost £2,983.

London CC.—15 flats in three-storey block and 20 maisonettes in four-storey block on Morant-st. site, Poplar, with 16 tenants' stores and play space:—

M. J. Gleeson (Contractors), Ltd. ..	£108,821
Thomas & Edge, Ltd.	102,781
The Unit Construction Co., Ltd. ..	100,163
F. R. Hipperson & Sons, Ltd. ..	99,910
W. J. Simms, Sons & Cooke, Ltd.	98,388
Gee, Walker & Slater, Ltd.	97,187
A. E. Symes, Ltd.	96,978
A. T. Rowley (London), Ltd. ..	96,971
Tersons, Ltd.	94,331
*Rowley Bros., Ltd., Tottenham ..	94,161

Architect's comparable estimate is £96,921.

London CC.—Construction at Ashburton estate, Wandsworth, of 40 flats in one two-storey and one three-storey block, together with maternity and child welfare and school treatment centre on part of ground floor of one block, and 18 tenants' stores:—

Carlton Contractors, Ltd.	£129,783
Perry's (Ealing), Ltd.	129,212
Rowley Bros., Ltd.	128,120
G. T. Crouch, Ltd.	123,405
M. J. Gleeson (Contractors), Ltd. ..	123,129
G. Ward (Ealing), Ltd.	120,147
Stewart & Partners, Ltd.	120,096
Tersons, Ltd.	118,998
The Unit Construction Co., Ltd. ..	118,846
*M. Howard (Mitcham), Ltd., Mitcham	116,755

Architect's comparable estimate is £121,875.

London CC.—Construction at Avebury estate (Squirries-st. site), Bethnal Green, of 128 maisonettes in two eleven-storey blocks, together with clubroom, 78 tenants' stores and playground. Tenders on basis A included the provision of individual flues to dwellings and basis B specified provision of interconnecting flues:—

	Basis A	Basis B
Rowley Bros., Ltd. ..	£359,874	£362,651
Gee, Walker & Slater, Ltd.	356,085	358,638
The Unit Construction Co., Ltd.	354,547	355,424
Thomas & Edge, Ltd. ..	349,896	351,254
M. J. Gleeson (Contractors), Ltd.	347,479	348,784
Stewart & Partners, Ltd. ..	339,816	341,950
Leslie & Co., Ltd	339,661	341,123
A. T. Rowley (London), Ltd.	338,230	339,451
Wates, Ltd.	338,210	340,558
Tersons, Ltd.	330,788	332,243
Carlton Contractors, Ltd...	326,748	328,192
*Rush & Tompkins, Ltd., Sidcup, Kent (on Basis B)	323,862	324,857

Architect's comparable estimate on Basis B is £324,306.

London CC.—Construction at Brandon estate, Southwark, of 408 flats in six eighteen-storey blocks, together with 156 tenants' stores, ten garages, six play spaces and two fitted playgrounds:—

Sir Lindsay Parkinson & Co., Ltd.	£1,307,516
W. & C. French, Ltd.	1,281,456
The Unit Construction Co., Ltd.	1,254,446
M. J. Gleeson (Contractors), Ltd.	1,221,830
Thomas & Edge, Ltd.	1,198,765
Tersons, Ltd.	1,179,025
W. J. Simms, Sons & Cooke, Ltd.	1,173,206
Rowley Bros., Ltd.	1,160,630
*Wates, Ltd., Croydon	1,138,343

Architect's comparable estimate is £1,215,388.

London CC.—Manufacture, supply, delivery, testing and maintenance of twelve electric passenger lifts for six blocks of dwellings at Brandon estate, Southwark, and installation of lifts under sub-contracts.

	Supply, etc.	Installation
Hammond & Champness, Ltd., Walthamstow ..	£85,632	£21,618
J. & E. Hall, Ltd., Dartford, Kent	83,700	16,626
Waygood-Otis, Ltd., Southwark	78,390	19,500
*The Express Lift Co., Ltd., Northampton	71,982	19,092

Chief Engineer's comparable estimates are £71,500 and £20,450, respectively.

London CC.—Works required for widening Finchley-rd., St. Marylebone, between Boundary-rd. and Finchley-pl.:—

Roads and Public Works, Ltd. ..	£63,165
Percy Bilton, Ltd.	59,753
William Old, Ltd., Harrow ..	59,194
Highways Construction, Ltd. ..	57,377
John Mowlem & Co., Ltd.	57,010
Frain Bros. (London), Ltd.	56,426
Cawood Wharton & Co., Ltd. ..	55,993
William E. Rees, Ltd.	55,980
The Neuchatel Asphalte Co., Ltd. ..	55,742
Ernest Knifton, Ltd.	55,310
W. & J. Glossop, Ltd.	54,320
J. Murphy & Sons, Ltd.	53,739
St. Mary's (Contractors), Ltd. ..	53,334
*Fitzpatrick & Son (Contractors) Ltd., Poplar	53,033
Linney & McLaughlin, Ltd.	50,524

Chief Engineer's comparable estimate is £55,820.

London CC.—Stores buildings with accommodation for day-workers at northern outfall works, Beckton, Essex. Tenders on Basis A allow for fluctuations in costs of labour and materials and on basis B in the cost of labour only:

	Basis	£
H. C. Horswill, Ltd.	A	£56,421

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C. Miskin & Sons, Ltd. .. A 55,930
F. R. Hipperson & Son, Ltd. .. A 54,682
The Demolition & Construction Co., Ltd. .. .. .. A 52,841
Ford & Walton, Ltd. .. .. A 52,716 / B 53,316
Wm. J. Jerram, Ltd. .. .. A 50,962
J. Gerrard & Sons, Ltd. .. A 50,763
R. J. Truscott, Ltd. .. .. A 48,500
Gray Conoley & Co., Ltd. .. A 48,469
*J. J. Dean, Ltd., Leyton .. A 45,787

Architect's comparable estimate on basis A is £54,376.

London CC.—Installation of central-heating and hot-water systems at Shoreditch training College, Cooper's Hill, Egham, Surrey. Tenders for boiler-house and external ducting were invited on either or both of two bases which would allow for fluctuations either in rates of wages and cost of materials (basis A) or in rates of wages only (basis B):—

	Basis	£
F. D. Hidden & Co., Ltd. ..	A	£17,302
Geo. Moss & Sons, Ltd. ..	A	16,226
	B	16,376
Janes (Builders), Ltd.	A	15,550
	B	15,575
*E. Clarke & Sons (Addlestone), Ltd., Addlestone, Surrey ..	A	15,209

Architect's comparable estimate on basis A is £14,948.

Engineering work in connection with the above:—

William Freer, Ltd.	£41,077
Richard Crittall & Co., Ltd.	39,841
A. G. Manly & Co., Ltd.	38,950
Norris Warming Co., Ltd.	38,685
Fred. G. Alden, Ltd.	38,188
G. N. Haden & Son, Ltd.	37,950
Barrett & Wright, Ltd	37,749
Newman & Watson, Ltd.	35,960
*Brightside Heating & Engineering Co., Ltd., Westminster	35,373

Comparable estimate of J. Roger Preston & Pntrs., consulting engineers appointed for this part of project, is £41,500.

London, EC.—Press hall and offices for 'Daily Mirror' on site of 50,000 sq. ft. nr. Holborn-circus on the south side of Holborn, EC1. Joint architects and engineers: Anderson, Forster & Wilcox (F/F), 9, Stone-bldgs., Lincoln's Inn, WC2, and Sir Owen Williams & Ptnrs., 44, Park-rd., NW1. QS: Langdon & Every, Kingsway-hse., Kingsway, WC2. *W. & C. French, Ltd., Loughton, Essex.

¶**London (MoW).**—Contracts placed for week ended September 14:—

Cheshire: Great Moor-st., Stockport, erection of Stepping Hill automatic telephone exchange, J. Gerrard and Sons, Ltd., Swinton, Manchester. *Hampshire*: Leigh Park, Havant, adaptations to form new branch post office, Brazier & Sons, Ltd., 303-5, Portswood-rd., Southampton. *Lancashire*: H.M. Stationery Office, Broadway, Chadderton, internal cleaning and decorating, A. Pugh & Co., 236, Bolton-rd., Irlams o'the Height, Salford, 6. *London*: King Edward-bldg., EC1, building work in connection with the renewal of lifts, numbers 5 and 10, H. C. Horswill, Ltd., 182, Green-st., Forest Gate, E7; Old Devonshire-rd., Balham, SW12, erection of Kelvin (Balham Tulse Hill relief) telephone exchange, Whyatt (Builders), Ltd., Bentley-hse., 225, Streatham High-rd., SW16. *Midlothian*: Jane-st., Leith, Edinburgh, erection of Post Office telephone exchange, Farrans, Ltd., 17, Rothesay-pl., Edinburgh 3. *Northumberland*: Ministry of Pensions and National Insurance, Benton Park-rd., Newcastle, internal decorations, A. H. Grabham, Ltd., 21, Blandford-st., Sunderland. *Staffordshire*: Eastgate-st., Stafford, erection of telephone exchange and telephone repeater station, Sir Lindsay Parkinson & Co., Ltd., 6, Lambeth-rd., St. George's Circus, SE1. *Warwickshire*: Northfield, Birmingham, new sorting, postal office, D. Charles, Ltd., Green-la., Birmingham, 9; Birmingham, 3, surveyor's maintenance, A. Reynolds & Sons, 39, Edward-rd., Birmingham, 12. *Yorkshire*: Remploy, Ltd., Barnsley, reinstatement of spray room, H. Field & Sons (Contrs.), Ltd., Stairfoot, Barnsley.

¶**London (War Dept.).**—Works contracts placed for week ended September 13:—*Anglesey*: Building, Watkin Jones & Son, Ltd., Bangor. *Berkshire*: Building, E. W. Beard, Ltd., Swindon. *Co. Down*: Building, Henry Cole,

Newry. *Gloucestershire*: Waterproofing, Western Asphalte & Tar Paving Co., Ltd., Bristol.

Middlesex: Heating, J. H. Nicholson & Co., Ltd., London. *Oxfordshire*: Roofing, Hinkins & Frewin, Ltd., Banbury. *Radnorshire*: Building, Ernest Deacon, Ltd., Kington. *Worcestershire*: Painting and decorating, N. S. Long, Ltd., Shrewsbury. *Yorkshire*: Building, Walter Thompson (Contractors), Ltd., Northallerton.

Maidenhead.—Assembly hall, classrooms, etc., at the Convent of the Nativity of Our Lord. A: John E. Sterrett (F), 21d, Ashley-pl., Westminster, SW. *J. M. Jones & Sons, Ltd., Maidenhead. (Negotiated contract.)

Morpeth.—70 houses at Spelvit-la., for TC. Boro' E: F. K. Perkins, 36, Bridge-st., Morpeth. *A. R. Robertson, Ltd., East Park View, Blyth. £116,764 (subject to Ministry approval).

Newcastle-on-Tyne.—Three-storey block of flats at Silver Lonnen. *E. Jeffocks (Builders), Ltd., Walbottle-rd., Newburn-on-Tyne.—Alterations and new fronts for British Paints, Ltd., Clayton-st. *Gill & Nicholson, 16, Boyd-st., Newcastle.—Large bottling stores at Gallowgate for Newcastle Breweries, Ltd. *Sir Robert McAlpine & Sons, Ltd., Northumberland-st., Newcastle.

Northallerton.—28 houses and 16 flats at Forest-rd., Northallerton, for UDC. A: Brierley, Syme & Leckenby (F/F), 10, Lendal, York. *Walter Thompson (Contractors), Ltd., North-rd., Northallerton (subject to Ministry approval).

Penrith.—12 houses at Threlkend, for RDC. *John Kitchen, Penrith.

Queensbury and Shelf UDC.—30 bungalows at New Park-rd., Queensbury. E&S: J. F. Hall, MIMunE. *John Scott & Son, Stone Croft, Gawthorpe, Ossett. *T. Giblin & Sons, 4, Scholes-st., Bankfoot, Bradford. *B. Warrington, 2, John-st., Farsley nr. Leeds.

Royal Tunbridge Wells. — 58 dwellings and one shop at Sherwood Estate extension for BC. *Perryman (Building Contractors), Ltd., 7, Castle-st., Tonbridge, Kent. £75,803.

Sheffield.—Following, for Regional Hospital Board:—Reorganisation of accommodation for female patients at Bracebridge Heath, Lincoln. *W. & J. Simons, Ltd., 12, Friars-la., Lincoln, £39,565; dual-purpose ward unit at Highbury, Nottingham. *J. W. Stamp & Co., Ltd., Nottingham. £24,442.

Shoreditch. — 44 two-bedroom flats, 16 three-bedroom flats and 42 one-bedroom flats, blocks 17, 18 and 19 respectively, Kingsland and St. Mary's estates, for MBC. Tersons, Ltd., £214,887.

South Shields.—Roads and sewers at Whiteleas. Boro' E: J. Reid. *Direct labour. £94,600.

Wallsend.—New building berth at shipyard of Swan Hunter & Wigham Richardson, Ltd. Constg. engrs: T. F. Burns & Ptnrs., 3, Ellison-pl., Newcastle-on-Tyne. *Demolition & Construction Co., Ltd., Queen-st., Newcastle-on-Tyne.

Walthamstow.—57 dwellings on Oatland-rise/St. Mary's-rd. site for BC. *P. G. Evans & Son, Ltd. £101,695 (subject to approval of the MH&LG).

Wednesfield.—100 dwellings at Ashmore Park estate, section 3, scheme 'A,' for UDC. E&S: Thos. A. Peacock, MIMunE. QS: H. Vale & Sons, Wolverhampton. *F. Tonks, Ltd., 42, Prestwood-rd. West, £116,999.

Westminster.—30-storey tower block of offices and flats on 3½-acre site of 21-41, Millbank and land at rear for Legal and General Assurance Socy., Ltd., in association with Vickers, Ltd. A: Ronald Ward & Ptnrs. (F/A), 29, Chesham-pl., SW1. Constg. engrs.: R. Travers Morgan & Ptnrs., 11, Victoria-st., SW1. QS: Franklin & Andrews, 173, Queen Victoria-st., EC. *John Mowlem & Co., Ltd.

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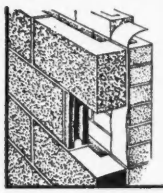

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